Louisiana Conservation Review

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Moods of Beauty

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The Great Outdoors
of the Southland

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How Federal Bureau
Aids Fishery
Industries

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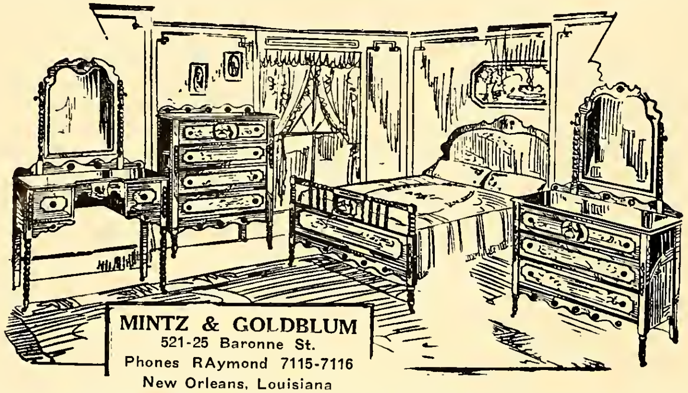**MINTZ & GOLDBLUM**
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VOL. I. **NEW ORLEANS, LA., SEPTEMBER, 1931** **NO. 12**

Newsprint Paper Produced by Use of Southern Pine

PRODUCTION of newsprint paper from southern pine has been accomplished experimentally at the Forest Products Laboratory of the Forest Service, Department of Agriculture, at Madison, Wis., and, if the process proves successful on a commercial scale, it may provide an entering wedge for the newsprint industry in the South, according to an oral statement June 5 by H. S. Betts, of the Branch of research of the Service. There still remain, however, problems of commercial manufacture to be solved before this development can be expected to take place, he said. The following information also was made available by Mr. Betts.

The young pine has been found to contain practically no resin, which has been the chief bar to the use of southern pine in making newsprint. Resinous woods do not pulp satisfactorily.

Costs of wood for paper making in the various parts of the United States have been computed by trade organizations in cooperation with the Forest Service, and the figures show the cost to be lowest in the South, next lowest in the West Coast States, and far higher in all other regions. For the South, the cost is about $7.56 a cord, for the west coast $8.96, for the Lake States, $12.43, and higher for other regions up to $18.04 in New York.

SOUTH HAS ADVANTAGE

Since the cost of operation is generally the same regardless of the region, the South has a distinct advantage in the low cost of the wood. For this reason, it has been able to dominate the kraft paper market, this type of paper being used for wrapping and for paper bags.

The South also is able to produce new crops of wood much more rapidly than the more northern regions. Trees 20 years old there are amply large for cutting for pulp purposes, and since the supply now is estimated at more than 2,000,000,000 cords in the South, replacements would make the supply practically inexhaustible.

It is unlikely there will be any sudden shift of the newsprint paper industry to the South even if the newly developed processes prove to be successful commercially. There are investments of millions of dollars in paper mills in the more northern States, and the supply of pulpwood there is far from exhausted.

If the process is successful on a large scale, however, the newsprint industry may be able to establish itself in the South using the cheaper wood supply. Diversification of products is one of the needs of the southern industry.

Louisiana Conservation Review

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JAMES P. GUILLOT . . . . Editor
N. E. SIMONEAUX . . Assoc. Editor
WM. G. RANKIN . . Business Mgr.

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Fish Hatcheries Taxed to Meet Demands of Depleted Streams

UNEMPLOYMENT, shorter hours of work, the automobile and improved roads are contributing to greater activity among anglers and are keeping Federal and State commissions busy supplying the Nation's streams with sufficient fish, according to an oral statement June 10 by Lewis Radcliffe, Deputy Commissioner, Bureau of Fisheries Department of Commerce.

Business depression has by no means dampened the ardor of the disciples of Isaac Walton, according to the commissioner, but on the contrary has "unquestionably" given greater impetus to the use of the line and tackle. Aside from offering an avenue of occupation to the idle worker, fishing is also being resorted to as a source of food, he said. Additional information was made available as follows:

For many years, interest in angling has been growing as the sport has increased in popularity and the ease of access to the country's fishing waters has been made possible by the building of roads and the increased use of automobiles. In some sections fisherman traffic to inland lakes has grown to such an extent as to necessitate the building of all-weather roads, despite the fact that travel on these routes is otherwise negligible.

With shorter working hours, the five and one-half day week, and the trend toward the five-day week, the increased time available for fishing has been reflected in greater demands for the stocking of streams, especially by private game clubs and by owners of small lakes and ponds where the full day's catch was formerly a certainty.

Besides the demand from these developments on the fish supply, the drought of 1930 also took its toll in the form of dried-up streams, lowered water levels and general stagnation. The Federal Bureau of Fisheries through its various stations throughout the country, the State commissions and private hatcheries are being enlisted to replenish the loss. The Federal Bureau's contributions in the way of fingerlings, frys, common and small fish have been somewhat less than those of the States.

Canned Salmon Ranked High as Economical Food

Valuable Vitamin Content Present; Quick Freezing Declared Best Method of Marketing Frozen Fish

CANNED salmon is one of the principal fish products from the standpoint of nutrition as well as economy, according to a statement just issued by the Bureau of Home Economics, of the Department of Agriculture, issued in cooperation with the Woman's Division of the President's Emergency Committee on Employment.

Salmon is one of the few foods from which it is possible to get Vitamin D, the antirachitic vitamin. It also contains Vitamin G, the foe of pellagra, the statement said.

The Bureau's statement follows in full text:

Among the outstanding food values in the markets at present are the various kinds and forms of fish that are found in the interior as well as along the seacoast, according to the Bureau of Home Economics, Department of Agriculture. Bargain rates are to be found especially in canned pink salmon and the large sized sardines which are packed in tomato sauce, either of which can be bought for about 10 cents a pound can.

Many marine and Great Lakes fish are moderate in price near where they are caught and comparatively little more expensive at a distance, thanks to modern shipping facilities. According to John Ruel Manning of the Bureau of Fisheries, United States Department of Commerce, frozen fish are fresh fish providing they are properly frozen and kept in storage.

Of the several freezing methods, quick freezing is by far the best, Mr. Manning declares, for then there is little, if any, possibility of a change in the chemical composition of the fish. Unfortunately this method is not universally used at present, but as soon as housewives demand quick frozen fish, the method probably will be adopted by all packers.

Package fish, which is the name given to steaks of cod, halibut and salmon and fillets of several species of fish, especially haddock, are shipped frozen throughout the country. They are so named because they are wrapped in varying weights for home and hotel consumption. This method reduces shipping charges, since the inedible portions are discarded at the packing plant. These are converted into fish meal for animal feeding, and, in some cases, valuable oils are a by-product. Because of the popularity of package fish the haddock, which is caught the year round along the New England seacoast, has surpassed in quantity the catch of cod.

Whole fish are also frozen and shipped, and the same rules for knowing whether a fish is fresh or not can be applied to the frozen variety, with the exception that the eyes may be slightly wrinkled and sunken. Frozen fish should be taken home and cooked while frozen and should not be thawed out before cooking, the Bureau points out. If the outside is heated quickly the juices will not leak out and the flavor will be retained. But the temperature should be reduced immediately after both sides are heated, and the fish should be cooked at a low temperature, for a short time to heat through and develop flavor.

(Continued on page 16)

". . . . a shimmering pathway, leading to a weird shadowland beyond."

MODOS OF BEAUTY*

By GEORGE ELWOOD JENKS
(Who Made the Photographs)

"BUT, pardon me," the girl's voice was apologetic and anxious, "you can't take a picture as late as this, can you?"

There was no answer from the mysterious head bobbing around under the focusing cloth behind the little camera on the big tripod. The Girl Tourist glanced at the glowing sunset across the little lake, and waited uncertainly. A moment later the cloth was whisked away and a tousled head appeared.

"Don't bother me!" snapped the Vagabond Photographer. "Every second's precious now!"

But his eager, rapt expression took the sting out of the brusque words. The Girl Tourist knew that look. She had seen it before. He was in the creative frenzy of the artist absorbed in his vision. So she waited and watched him as he worked—swiftly and deftly. The ground-glass slide was slipped from its groove in the "plate back" and thrust unceremoniously into the hip pocket of his worn and baggy trousers. Next he snatched a cut-film holder from the battered brief-case and slid it into place. Then around in front he closed the shutter and slipped a color filter over the lens. Finally he drew the slide carefully out of the holder, resting the other hand firmly on the top of the camera to guard against the slightest shifting. He grasped the bulb and turned to study the sunset through narrowed lids. None too soon!

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*Reprinted by special permission from July issue of "American Forests."

". . . . across the high bridge of Make-Believe . . . . to the enchanted shores of Fantasy-Land."

"Now," he whispered warningly, "hold your breath!"

She obeyed literally, caught in the contagion of his mood. The shutter clicked open. He seemed to be sensing the proper exposure as he concentrated on his scene. At last the shutter clicked again and the tense figure came to life.

"I think we got it!" he exulted. "And if we caught half of that beauty—but pardon me, what was it you asked?"

The question was repeated. "Of course you can take a picture at sunset," he responded. "Or any time when there is light—even moonlight, if you give it time enough. Here's a sunset scene I took here last week." Again he delved into his carryall, and a moment later handed her an eight-by-ten enlargement and turned back to his packing. She stared at it.

"O-h-h-h!" she breathed at last. "How lovely! I'd give anything to be able to get pictures like that."

"Well," he smiled, "why not?" He dropped his work and came over to her side, unable to resist the sympathetic responsiveness.

"I wish I knew why not!" she wailed. "I've been traveling for months through wonderful scenery, but my pictures are always disappointing."

"I know. I have knocked around in the wilderness for many years, but I have learned to find my best pictures right here in this little park, three blocks from where I live. Do you remember what Longfellow said?

" 'O thou sculptor,
painter, poet!
Take this lesson to
thy heart;
That is best which
lieth nearest;
Shape from that thy
work of art.' "

"Yes," she answered absently, studying the picture for a solution to her problem, "but you must have a wonderful camera."

He grinned, glancing significantly from her spick and span "3-A Special" to its battered twin-brother on his tripod. "Cost me less than half the price you paid for yours. Has a cheap lens and fickle shutter. Fortunately my own color-filter and plate-back for cut film fits, but those things are luxuries, not necessities."

The girl shook her head helplessly and began to open her vanity case. "Then what is the secret?" she demanded. "My pictures are flat and monotonous and uninteresting!"

"Sure!" he commented dryly. "Taken strictly according to the regular snapshot formula—between 9 a. m. and 3 p. m., with the sun at your back."

"But isn't that right?"

"For ordinary snapshots, but not if you expect to get the sort of pictures you seem to want." He mused for a moment. "Let's sit down and watch the shadows creep. You know, I really like to talk," he confided frankly, relaxing in perfect comfort into the hard wooden seat, "and perhaps I can give you some tips on how to get better pictures."

"Something like a million fine books and articles on art photography," he began, "have been written by experts—for experts. At least, most of it seemed to go over my head. There was something lacking in them—or in me. Many times I have longed to grab one of those authors by the neck, back him into a corner, and yell: 'Yes—but just exactly how do I begin?' Yet I got a little something out of each one, tried out this bit and that bit, checked up with my own successes and failures, and finally worked out my own creed.

". . . . was revealed—a silvery Undine, lighting the Lily-Glow."

"I am not an expert, either as a pictorialist or a technician. Never worked under an expert nor in a professional studio—never won a prize nor had a picture hung in an exhibition. So I am not likely to talk over your head. You may not believe me or agree with me, but at least you can understand me. Well—are you listening, or are you dreaming about that shadowy, mystic island out there?"

"Isn't it haunting? But go on—I am hearing every word."

"I reckon I am like the dub who learns to play the violin 'by ear.' Somehow he often gets the heart of the thing, and plays it straight into your heart. I'll never forget one night, years ago, when I saw a tramp dish-washer hold a bunch of tough cowpunchers spellbound for hours with the music he coaxed from the heart of a cracked and discarded old fiddle. He made that old box talk! That is what I am trying to learn to do with my camera.

"Good technique is necessary, but you will absorb that as you go along. The soul of the thing must come from the heart of the artist. Otherwise the creation is dead and lifeless—technique or no technique. Here are two wise sayings that get right down to the root of the matter. One is by a famous photographer, the other by a great painter and teacher.

" 'My camera sees what I see!' says Nickolas Muray.

(Continued on page 33)

The Great Outdoors of the Southland

By W. L. BROWN

TWENTY ODD miles from New Orleans, across the placid waters of beautiful Lake Pontchartrain—from the Northern Shore of which the Great White Way of Canal Street is clearly visible, as are the beacon lights of the great metropolis, standing out like huge stars to steer the course of pleasure craft lured to the remotest recesses of one of the most fascinating waterways in the Southland—lies St. Tammany, the world famed ozone belt of Louisiana, where once lived the Choctaw Indians whose hunting grounds were set in long leaf pines interspersed with nature's own plantings of Evergreen Magnolias, Silver Maples and giant Live Oaks festooned with Spanish Moss, 'neath which, and 'long side, deep quiet bayous of crystal clear water Wigwams held sacred the same sentiment expressed in our own "Home Sweet Home."

A striking example of good judgment. Not one oak was cut when the highway was constructed.

These great piney woodlands, elevated quite above the city of New Orleans so few miles distant, are level near the lake, then rolling into little knolls and dales, increasing by distance from the lake into hills and valleys. Fresh water streams, fed by natural springs bubbling over with the very elixir of life, wind their ways through high banks and over bars of snow white sand, dashing ever onward, until, as if tired of frolicking or cautiously approaching the big rivers and peaceful bayous, they become more quiet—maybe, because of the sheer beauty of the surroundings, or perhaps to revel in their own individualities; for here and there, their waters divide to form little "Isles of Pines," bay trees, hollywood, honeysuckle, and myriads of wild flowers, all in natural park array, with lagoons, rustic bridges of logs, piers and everything not made by hands. These streams are the veritable habitat of the Finny Tribe—green trout basking in the swift shallows, then darting away to shady pools, only to be lured by the likeness of a dainty morsel cleverly tendered by an expert angler—the rock fish tipping the scale at from ten to twenty pounds, matches wits with the best of sportsmen—and the big mouth goggle-eyed perch, a "poor fish" to think an artificial fly the *hors d'oeurve* of a banquet. Where the waters of rivers and bayous mingle with the lake, the Silver King holds domain, yielding supremacy to a lightweight angler, only because of the subtle art of deception and then after a battle—of hours—maybe two, three, or five. In the lake the mighty red fish, innocent sheepshead, docile flounder, game lake trout and striped bass, chase the elusive shrimp and scorn the lowly crab. But they are all fish—susceptible fish.

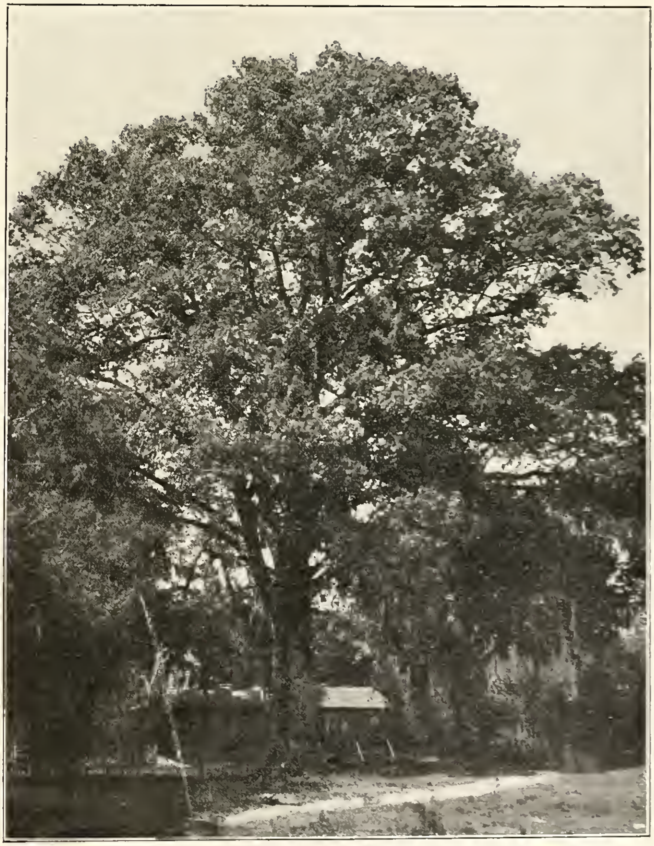
Surely nature designed this area for a great woodland park, else it would not have lavished such variety—hills and hollows, meadows, plains, and lowlands—lakes, rivers, bayous, brooks, and springs—the pines, wildwoods in profusion—fruit and nut bearing trees and shrubs for food to sustain its countless wild life, and flowering plants, palms, ferns, and moss to complete a setting incomparable in natural scenic beauty.

Truly it was a "happy hunting ground" for the Choctaw, who bequeathed it in all its grandeur to his palefaced brother. Here, in the lowlands, peacefully nipping the palmetto seed, are wild deer in herds; small game in great variety inhabit wooded places prepared especially for their kind; wild ducks spend their winters here as do great flocks of geese; wild turkeys are native—pheasants, quail, woodcock and snipe galore, with countless companions to complete nature's perfect plan.

Choctaw legend and modern science acclaim this one of the most delightfully healthful spots in the world—the climate, equable, comparable to that of Southern Italy—the air rich in ozone, soft and balmy, lulls one into a mood of peace that surpasseth understanding. Nature's own fountain of pure sparkling water underlies the whole region, bubbling forth in springs where egress is possible, or awaiting the opportunity of an artesian well. It may be the climate—may be the air—may be the water—or it may be the pines, be it what it may, 'tis truly a delightfully healthful spot.

And recreations of every outdoor kind abound—golfing on nature's own greens; a canoe, skiff, or power boat will take one miles and miles into the very heart of nature by way of rivers, bayous and tributaries navigated by the red man in the days of legend; sailing on the lake, or an ocean going yacht through the Rigolettes into the Mexican Gulf or across the lake and through the great Industrial Canal into the "Father of Waters," and on to the "Seven Seas"; bathing on Pontchartrain's hard sand beach or lazily idling the hours 'neath a moss covered oak, listening to what the wild waves are saying; a dip and swim in the cool crystal rivers; wading the shallows or tramping on the wide river beaches of pure white "singing sands"—so called by the Indians because of the musical sound of footsteps in the sands—bridle paths through natural wildwood parks where flowers think springtime is perennial—a fox hunt if so inclined—game in season and fishing to the heart's content; motoring over winding scenic highways of pure white shell contrasting with evergreen roadsides or tunnels of overhanging boughs; on and on among the pines, under spreading oaks, through virgin forests of magnolias, over the hills and around the curves with new delights at every turn, interrupted only by frequent intersections of concrete highways reaching to the uttermost parts of the nation.

Here and there along the highways and byways, surrounded by towering pines permeating the air with the aroma of incense, a little hill, so perfectly formed, with wide level top and long sloping sides, that one might think it had been designed to some landscape artist's special order, and set in giant oaks, there and yonder, and then to complete a picture, draped with living moss where only an artist could direct. Amid these natural beauties—lawns bordered and interspersed with evergreen hedges, multi-colored flowers and ever-blooming roses. Sparkling water overflows an artesian well into a pool of lilies and water fern, where gold fish play hide-and-seek and lazily listen to moonlight sentiment. Orchards of pecans, figs, pears, peaches, plums, and grapes—gardens of vegetables and luscious red ripe strawberries—orange groves always green in rich contrast with blossoms or golden fruit, and hundreds of snow white leghorns everywhere among the orange trees merrily chattering expressions of gratitude for nature's blessings so richly bestowed. And in the midst of it all a home, where peace and harmony prevail and one lives most fortunate. Many are there, of such home sites, varying in terrain and settings to please the most fastidious, awaiting habitation by those who love the won-



—*Courtesy U. S. F. S.*

"Thou hast lived before, live after me,—
Thou ancient, friendly, faithful tree."

derful things God made outside the cities.

'Tis a Great Outdoors! But not without comforts and conveniences—unlimited water supply under natural pressure throughout home and grounds—electric light and power from high power lines along the highways—natural gas from the pipe lines and telephones everywhere—modern schools and churches of all denominations at convenient locations and in the towns and villages throughout this empire, where also are picture theaters, stores, hotels and facilities for the shopper or pleasure seeker and for whom the city stores and establishments maintain a rural delivery system.

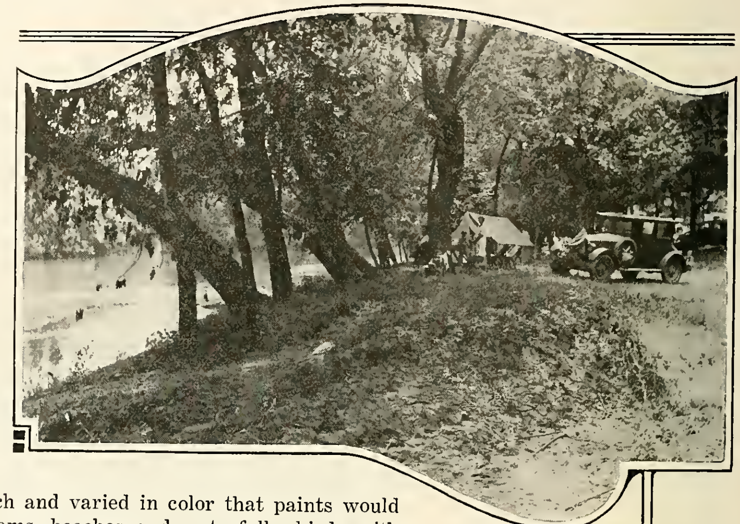
May not the wanderer have sojourned here—and with palette, strived to depict the marvelous beauties; incomparable vistas, stately pines and moss covered oaks, flowers so rich and varied in color that paints would fain express, rippling streams, beaches and waterfalls, birds with plumage indescribable, a fawn? Ah! the sunset is descriptive of the whole, but the colors ever changing and the picture as varied as the days—Eternity will find him painting. So in a few words he endeavors to portray this Great Outdoors of the Southland.

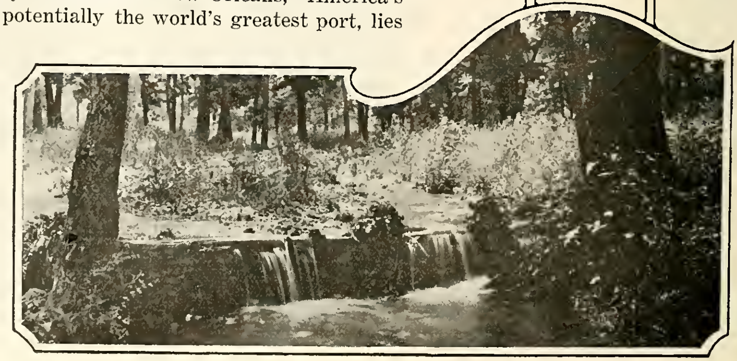
Oh wanderer who has traveled far,
'Neath Southern sun and Northern star,
Tell me where the fairest regions are.

'Mid Northern climes, 'neath Southern skies,
Where beauty, health and happiness lies,
There are the bowers of paradise.

Within a radius of twenty odd miles of New Orleans, "America's most interesting city," and potentially the world's greatest port, lies a hundred thousand acres or more of this Great Outdoors—It is wonderful agricultural soil; it could be converted into great commercial orchards, nurseries and flower gardens; it is ideal for dairying—But who would want to desecrate so marvelous a situation. There are millions of acres in farms, orchards, gardens and dairies. More than enough to supply profitably all the foodstuffs required for a very long time—And there is not another Great Outdoors just like this in all the world. It must be preserved, conserved and developed. What will it mean to the city of

(*Continued on page 35*)





Development of State Forest Parks

Pennsylvania's Method Outlined by Forester.

By

CHARLES E. ZERBY

District Forester,
Commonwealth of Pennsylvania

IT HAS been nearly two and a half years since the Commonwealth of Pennsylvania acquired title to Cook State Forest Park, thus bringing to a successful conclusion 20 years' untiring effort on the part of those interested in preserving this irreplaceable bit of the original forest for posterity. The Legislature made possible this purchase by an appropriation of $450,000 to augment the $200,000 already raised by popular subscription toward the set price by the Cook Forest Association. Management of the park was vested in the Department of Forests and Waters; the commission plan of management not finding favor with the Legislature.

Under the State's management the first field activity was to remove the "No Trespassing" notices of the late owners replacing them with the usual State Forest "You Are Welcome" placards. A superintendent and two assistants were appointed, an office opened, machinery, tools and equipment purchased, supplies and repair materials ordered, and laborers employed.

While these surveys were in progress large crews of men were engaged in cleaning up the 20 years' accumulation of debris—weeds, brush piles, dilapidated buildings, and valueless tree growth (fire cherry, aspens and alders) that had sprung up about the buildings. In some instances this worthless growth had completely concealed the vista of big timber.

The next pressing demand was the preparation of the park roads and trails for the many visitors who early thronged into the park. The existing road and trail system was used. More than 11 miles of trails were improved by removing brush and windfalls, and grading and drainage where needed. The township roads within the park, totaling 12 miles, were ditched, crowned and smoothed in co-operation with the local supervisors. Old abandoned logging roads totaling six miles in length were opened, drained and made passable. They will be widened gradually with subsequent workings. New metal culverts were placed.

The treatment of the old buildings received very careful thought. The needs of administration, recreation, and housing of the permanent personnel received first consideration. The condition of these buildings has been aptly described "the mill roof sinks in a tangle of blackberry bushes; under the shade of the forest scattered dwelling houses grow mossy in decay." The problem was to determine whether the building was too far gone to justify expense. Repairs under the advice of a competent architect were made to two dwellings, an administration building, and a combined shop and garage which was formerly the village post office.

Two new reservoirs and complete water systems were installed to supply the buildings and adjacent recreational areas The first constructive step in cleaning up the Clarion River was taken when the State-owned buildings were connected to approved sewage disposal systems.

For the convenience of the public, parking areas were cleared, tourist camps established, numerous tables and benches supplied, fireplaces erected, springs walled and water piped, garbage receptacles provided, latrines of approved construction built, foot bridges built, guide arrows placed on roads and trails throughout the park. A large open pavilion and a wading pool have been built at the Indian Camp area. A descriptive folder for general distribution has been printed. An exhibit of wild animals loaned by the Board of Game Commissioners attracts many people.

The management of Cook State Forest Park presents some big problems. In the development the best talent from other State departments was consulted and their reports carefully studied. No extravagant or elaborate development was contemplated. Many good suggestions came in unsolicited.

Plans for the future of the park have been worked out which will permit the gradually unfolding of a development in keeping with natural conditions and the avowed purpose of the originators—"for the purpose of preserving and perpetuating a portion of the original forests of Pennsylvania and in the interest of wholesome outdoor recreation and the study and enjoyment of the same to the people of the Commonwealth for forestry conservation and the preservation and maintenance of distinctive natural views and conditions."

Obey the laws of State and nation; work for better laws, and uphold the law-enforcing authorities.

Prizes Awarded for Bird Conservation Essays

ESSAYS which won the prizes as announced in the April CONSERVATION REVIEW and given by Mr. Floyd A. Johnson are printed in the following pages.

WINNERS OF THE PRIZES IN THE HIGH SCHOOLS

First—YVONNE LATIOLAIS, Eighth Grade, Carencro High School, Carencro, Louisiana. $25.00.

Second—AUDIS VAUGHN, Eighth Grade, Kentwood High School, Kentwood Louisiana. $15.00.

Third—MAHLON McCRORY, E. C. Byrd High School, Shreveport, Louisiana. $10.00.

WINNERS OF THE PRIZES IN THE GRAMMAR SCHOOLS

First—ESMOND KEATING, Seventh Grade, Sacred Heart School, 3236 Canal Street, New Orleans, Louisiana. $25.00.

Second—JAMES O. STAMPLEY, J. W. Hoffman School, 2939 Third Street, New Orleans, Louisiana. $15.00.

Third—EARL THORNTON, Sixth Grade, Lida Benton School, Monroe, Louisiana. $10.00.

Why North American Birds Should Be Conserved For Future Generations

By YVONNE LATIOLAS, Carencro High School

IT will be a sad day for the American farmer when the last insect eating bird of our country is brought fluttering and lifeless to the ground. When the armies of destroying insects begin to multiply unchecked and send forth their million and tens of millions, then will the husbandman realize the value of the allies he has lost, and vainly wish to exchange any number of grapes and cherries for the once-despised robin, thrush, and blackbird, and many other birds that are a help to him.

Birds are one of the greatest helps to farmers. We would not have any crops if it were not for them. They eat all harmful insects that injure the crops. If the birds were properly protected, while rearing their young ones, they could save many more million dollars worth of crop.

In all save a very few localities in North America, the robins are treated as friends. In the grape belt of Western New York they are a great annoyance to some grape growers because of the bunches they disfigure. Elsewhere they are of great benefit to farmers, and the few cherries they take in cherry time are very modest compensation for the bad grub they pick out of the freshly ploughed fields.

There are many birds that we should conserve and others that we should not conserve for future generations. Take for example, the ruby-crowned kinglet. This is one of our smallest birds and is easily recognized by the tiny tuft of ruby-red feathers on the crown of its head. In life it is so modest and retiring that it is seen only by sharp eyes. This little bird is valuable as an insect destroyer especially in the late autumn when other insectivorous birds have gone it works industriously upon the trunks of evergreens.

The nuthatch and titmouse family deserve to rank as prime favorites. They remain with us through the long and dreary winter, when all save a corporal's squad of the grand army of birds have fled southward and left us to our fate. They are exceedingly industrious, and their efforts are directed against insects of very destructive habits, the tree-borers and the barklouse. In their work they are not continually playing and telling people how busy they are.

The yellow warbler or summer yellow bird has beauty that far surpasses its minstrelsy, for it is but an indifferent singer. The fact is, however, it has so much work to do in catching insects that it has little time for music, for it will be noticed throughout the bird world that the most diligent insect-catchers are not in the habit of singing over their work. This is due to the same reason that a good deer-hunter does not talk and tell stories while following a trail.

There was a time when in America the sparrow was not only respectable, but it was even honorable to be a sparrow, but during the past ten years the doings of one alien species, most unwisely introduced here, have tended to bring the name into disrepute. But we protest that our native sparrows are as sweet-voiced and interesting as ever they were, and as wholesale destroyers of bad weeds they are unsurpassed.

The English sparrow is one of the uncleanest little wretches ever heard of. It grubs in the dirtiest streets and lets all kinds of insects crawl over it and never kills one. It is very quarrelsome and keeps out many other kinds of helpful birds.

The rose-breasted grosbeck is an enemy of the potato bug, and it feeds mostly upon other insects, birds, blossoms, seeds and fruit.

The Baltimore oriole has beautiful plumage of orange and black, a very pleasing song, good habits, and, therefore, is one of our feathered favorites.

The usefulness of the Balitmore oriole is fully equal to its beauty. As a destroyer of caterpillars it has few equals among birds.

The blue jay is just a nuisance. He will take your cherries right before your eyes, and then scold you roundly for not looking pleasant about it. He robs the nests of other birds, eating the eggs or the young ones, and to that extent he is a pest. During the closed season on eggs and young nestlings, he lives on insects until berries and small fruits ripen. If jays were as numerous as English sparrows, it would be necessary to reduce their number, but they are not so numerous or so destructive that we need to attack them.

The common crow needs no description. When finer birds were abundant we cared little for him, but now that bird life generally has so greatly diminished, we feel like welcoming him as a friend. It is declared, after an examination of the stomachs of these birds, that the bad insects destroyed by the crows, such as cutworms, caterpillars, grasshoppers, and also mice, represent a saving of more grain than the crow consumes.

It must be admitted, however, that the crow does many things he should not. He is too fond of eggs and young birds. He will pull up by the roots altogether too much newly planted corn, which is very unfair to the farmer. While the damage is seldom serious, it is always annoying, but when the crow passes the limit of human endurance powder and lead are his portion.

There are many little birds, in size next above the sparrows, which look as if they ought to sing, but in reality they do not. They are very expert at catching insects, however, and nothing that flies can escape them in mid-air. These birds make up the family of flycatchers and to the farmers of this country every flycatcher is worth double its weight in pure silver. Altogether there are about thirty kinds.

The nighthawk is far from being a nighthawk. It belongs to a family of birds which have soft, owl-like plumage, and enormous mouths, fringed above with a row of stiff bristles for use in capturing insects on the wing.

Whenever, during the hour just before sunset, you see a good-sized bird with dark plumage, long, sharp pointed wings, and a big white spot on the under surface of each wing, wheeling, soaring, dropping and circling through the air, you may know that it is a nighthawk catching insects.

The woodpeckers are the natural protectors of the forests of the temperate zone. If it were not for them, tree-borers would multiply without limit and the number of trees that would fall before the insect pests is quite beyond computation. While the robin, the thrush, and the warblers take care of the caterpillars and the leaf insects and looks after the pests that attack the bark and and looks ofter the pests that attack the bark and the wood. The tree-creepers assist by picking off insects from the outside, but when it comes to the heavy work of digging borers out of the bark by main strength, the woodpecker is the only bird equal to it. There are twenty-five kinds of these birds in the United States.

It is now a well established fact that owls are among the most beneficial of all birds, inflicting little damage upon the producers of poultry and benefiting the farmer by the destruction of insect pests. With the exception of the great horned owl, the owls of our country are by no means so destructive to poultry and wild bird life as is generally supposed. The great majority of these birds feed upon wild mice, rats, squirrels, fish, and insects, and some of them render great service to man. Nearly all owls are night-flyers, and by reason of their soft, fluffy plumage, which makes their flight quite noiseless, they are especially fitted to keep in check the grand army of destructive rodents that roam abroad under cover of darkness.

The barn-owl is to rats and mice as the cuckoo is to the caterpillar. As a destroyer of the meanest vermin on earth—rats, this bird has no equal. Whether North or South, in the tropics or the temperate zone, it loves to live under the roof of civilized man, especially in church-belfries.

The jaunty little sparrow hawk is a destroyer of grasshoppers, beetles, crickets, caterpillars and other insect enemies; this little hawk deserves to rank with the birds most beneficial to man. For so small a bird, the number of grasshoppers it consumes in a year is enormous. Where insects are obtainable it never kills a songbird, but it does destroy great numbers of mice.

The pigeon hawk is just a little bit larger bird than the sparrow hawk, and is of little use to man and deserves to be shot whenever found. It kills, sparrows, thrushes, goldfinches, bobolinks, and many other birds.

The hawks of North America above Mexico form a group of about thirty-four kinds. Some of them are useful to man, and some are so destructive and generally useless that they deserve death. It is very important that we know the difference between hawk enemies and hawk friends.

The robin is one of the sweetest and most joyous songsters. He sends forth a liquid melody, clear, and sweet, when he is exceedingly joyous.

Everywhere the robin is a very sociable bird, and you can distinguish him very quickly as a friend or a foe.

The wood thrush is a grateful little creature that often works overtime making the forest melodious; it is one of our sweetest singers. It is not so bold and confident as the robin, and mostly follows the robin. Its favorite haunts are the sweet shady woods and thickets.

The brown creeper represents a family of small birds of tree-climbing habits but with bills that are rather too slender for work in bark. They are not fitted by nature for digging a modest and retiring borer from the bottom of his tunnel, and therefore they make a specialty of bark-lice and other surface wood-workers which can be picked off without hard digging.

Birds of North America should be conserved for future generations as insect destroyers or as songsters. Useful birds should be protected, but birds that are useless and of no value to farmers should be put to death because useful birds are kept away from farmers by the harmful birds.

Why North American Bird Life Should Be Conserved for Future Generations

By AUDIS VAUGHN, Kentwood, La.

BIRDS are one of the most beautiful offsets to a country or state. In Louisiana many sanctuaries have been established and laws passed. In spite of this, the hunters and campers still kill some of the most beautiful birds.

Many tourists come from other parts of the country to Louisiana especially to see the bird life.

Birds give beauty to a state. This statement is infinitely true. The different colors of the birds give a contrasting color to the woods, and even homes. The redbird, blue bird, blackbird, scarlet tanager, and many other species are found in Louisiana during some part of the year. These flash across the road, or sit in trees, making the woods prettier. If all these birds are killed, and they surely will be if the laws are not enforced more strictly, the state will lose a good bit of its beauty.

Birds are of much benefit to the farmer. If he sees a bird in his garden, usually he will throw rocks to scare it away. Even though the farmer doesn't mean to hit the bird, sometimes he does. The birds are merely eating insects when they are found in a garden. If the birds were left alone, they would probably destroy all the insects that are a nuisance to the farmer.

Birds are beautiful singers. Many poets have written poems about the songs of birds. Each spring, especially, is the air filled with their beautiful melody. The songs of the blue bird, whip-poor-will, bobolink, cardinal, thrush, wren, oriole, and many other kinds are heard early in the morning. There are many people who love to hear the birds sing. If these could encourage the hunters to obey the game laws, there would be many more song birds for our future generations to hear and learn to love.

Birds afford an interesting study to people who are interested in them. Their lives are often studied by boy and girl naturalists from the time they hatch, until they become full grown birds. Many people love to go in the woods and fields to study the haunts, habits, and lives of birds. If the people who are interested in birds could make the other person understand that birds were put here for a definite reason, they might be convinced and study them, find the reason they were put here, and obey the game laws.

If people studied birds, they would learn to understand them and in turn grow to love them. If this could be accomplished, the hunters would kill only the game birds, in the game season, and then there would be left for the future generations the privilege their ancestors before them enjoyed.

Why North American Bird Life Should Be Conserved for Future Generations

By MAHLON MCCRORY, 838 Fairview Street,
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EVERY essay has a certain purpose and the purpose of this one is to create a greater interest in the bird life of North America. The younger people of today especially should be made to realize the importance of our birds, because they are to be farmers of the future.

Perhaps some might say that birds are of no economic value today because insecticides have been perfected that control insects. It is true that insecticides aid us greatly in controlling insects, but none has been nor shall be perfected that can compare with our feathered friends. We are dependent upon our birds for our food because entomologists say that agriculture would come to a standstill if there were no birds to devour injurious insects.

Birds should be conserved for the future generations from the standpoint of agriculture, sports, and beauty.

Birds as a rule live a short life but they live fast and a huge quantity of food is required to maintain this life, by eating various insects, weed seeds, and rodents, they render very valuable service to agriculture. These bipeds are next to the domesticated animals from the standpoint of agriculture. By eating insects they render great service and for this reason deserve protection. In addition they eat weed seeds and rodents.

It would be very monotonous to take each and every bird and tell what it eats, so I have chosen some of our more familiar friends of agriculture.

One of the most useful family of birds is the sparrow family, but because one member of this family is a pest the majority think the others are. This family of birds consume hundreds of tons of weed seed yearly and the farmer cannot overestimate their value. In an agricultural state like Iowa, the tree sparrows consume 875 tons of weed seed yearly. The adult tree sparrow eats one-fourth ounce of weed seed daily. It is estimated that the sparrows in 1910 saved the farmers of this country $89,260,000.00. While speaking of the seed eating families, I think it is necessary to mention the doves and ducks. The Bureau of Biological Survey says that in one stomach of a mourning dove were found 7,500 seeds of yellow wood sorrell, in another 6,400 seeds of barn grass. The ducks who are only thought of as game birds eat numerous weed seeds. The stomach of one duck taken in Louisiana in February contained more than 72,000 weed seeds.

Another group of birds that render us valuable service are the owls and hawks who eat harmful rodents. These birds possess a bad name but they really do not harm us. It is true that some hawks and owls eat other birds and chickens, but on the other hand they more than pay us back by eating rodents. Mr. F. E. L. Beal says that more than 3,000 pelts of rats and mice were found under a tree which housed two barn owls. These rodent-eating birds also feed upon crickets, grasshoppers, caterpillars, and the pocket gothers who girdle various fruit trees.

The third and most important group of birds from the standpoint of agriculture are those that feed upon insects. Most all birds feed upon insects to a certain extent but some eat more insects than others.

The woodpeckers are one of most familiar and most valuable insect eaters. They are enabled to dig into wood with their bills and catch grubs and insects that the other birds cannot get to. But because of the sap-suckers, who are correctly named, the woodpeckers are persecuted. When the people learn to distinguish our useful birds, wood beetles and grubs will be scarcer.

Another group of birds that deserve praise and protection is the family of grosbecks. Each member of this family pays special attention to one certain insect who would do great damage if not held in check. Few birds are to be credited with more good and fewer evil deeds than our grosbeaks and every one should gladly aid in protecting and attracting them.

Nearly every day I have the pleasure of watching a pair of kingbirds who perch on a nearby telephone wire while gathering their food. They sit patiently until they see an insect then after him they go, circle, and return to the wire and wait for another. He is a pronounced enemy of owls and hawks. The bird eats blister beetles, robber flies, cander worms, cutworms, and a few other insects. It is said that it eats honey bees to a great extent, but what few bees it eats consist mostly of useless drones.

Nature also gave us birds who patrol the air, namely; the swallows and swifts, nighthawks and whip-poor-wills. The night hawks and whip-poor-wills patrol the air at night in search of various insects, while the swifts and swallows do likewise during the day. A tree swallow's stomach taken in Texas contained 68 cotton-boll weevils, and 35 cliff swallows had taken an average of 18 cotton-boll weevils each.

One may readily see why the brown thrasher gets its name. Its coat is brown and it thrashes out leaves and brush while in search of food. It obtains most of its food from the ground; about half of its food consists of beetles, grasshoppers, crickets, bugs, cutworms, caterpillars, and millipeds comprise the remainder.

The wrens, humming-birds, nuthatchers, kinglets, fly catchers, and other small birds deserve as much praise as the larger because they devour insects that the other birds do not notice. Spiders, ants, insect eggs, flies, gnats, plant lice, scales, leaf-hoppers, and other minute insects are devoured by our smaller feathered friends.

The bluebirds, robins, thrushes, shrikes, blackbirds, meadowlarks, red-winged blackbird, crackles, orioles, blue jays, bob whites, snowbirds, and others, aid us greatly by eating injurious insects.

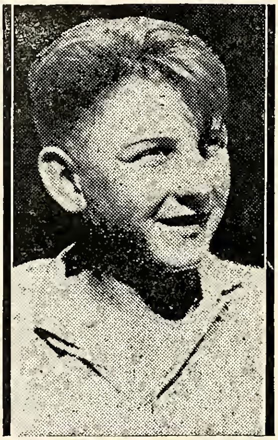
Birds should be conserved because of the sport in hunting them and the delicious meat that covers the game bird's body. Our forefathers depended upon birds for food but today the hunter is hunting our birds too closely. Most any sportsman would rather stop the flight of a ruffed grouse or a duck than any mammals. The bob white, who is the most widely known of the game birds, is being hunted too closely in some cases, and it should be strictly protected (not necessarily taken from the game list), not merely because it is a game bird but because of its value as an insect and weed seed destroyer. The snipes and killdees, who are game birds, render valuable service by destroying various water insects. If strict laws are not made and enforced the future generations will not be able to enjoy the sport in hunting birds nor eat the delicious meat covering their bones.

The third and last reason that birds should be conserved for future generations is their beauty. The face of an owl may not show any marks of beauty but its work is beautiful. The coat of nearly every bird is beautiful, but the three that I think possess the most beautiful coats are the bluebird, humming bird, and tanager. There is nothing more beautiful than a bluebird perched upon a fence post with his reddish-brownish breast bulged out and his blue coat that is so pleasing to the eye. Who could want to look at anything more beautiful than the scarlet tanager hopping about in some evergreen. The little humming bird, who is our smallest bird, may be seen poised before some flower in the garden, then, like a flash of lightning, he backs up and darts away.

North America is not only the home of beautiful colored birds, but the home of skillful nest-builders and songsters. The orioles are noted not only for their song, but for their nest which they hang from the brow of some tree. No human can build anything to compare with it. Another of our skillful nest-builders is the humming bird. Its nest is so skillfully made that it can hardly be dctected from a growth on a tree. It has no song because it doesn't need it. The most loved songster of North America is the mocking bird, who is the only rival of the nightingale. The mocking bird pours forth its melodious song while perched or in flight. It is well named because it does mock many of the other birds. The larks, warblers, thrushes and a few others lend beauty to nature by their song.

The aquatic birds, as a rule, have less economic interest than other species. In some states the birds are persecuted because they feed upon fish, but I think that we should protect them because they give much beauty to our waters. All of us enjoy the sight of the kingfisher while perched upon an old snag. We all enjoy, especially any true Louisianian, the sight of the pelican as he scoops up his food. Any one who is a lover of birds will gladly agree to protect our aquatic birds.

In conclusion I wish to say that when we, the people of North America, learn to love and protect our birds, we shall have come to ourselves.



ESMOND KEATING

Winner of First Prize in Grammar Schools.

Why North American Bird Life Should Be Conserved for Future Generations

By ESMOND KEATING
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WE are told that Moses advocated bird protection and that Solomon marked the seasons by the singing of birds; and we note that all down the ages birds have been loved for their wonderful intelligence, their beauty of plumage, their grace, and their marvelous mastery of the air, but most of all they are loved and protected because of their economic value.

Even if we do not appreciate birds for their uplifting and esthetic appeal, we should protect them for their economic value. The prosperity of our nation depends largely upon agriculture and any agent that serves to increase the size and insure the certainty of our crops is of vital importance to the agriculturist and the people as a whole. Birds constitute one of the most valuable agents on account of their food habits, living to a large extent upon insects which are among the farmers' most dreaded foes. A knowledge of these insects and of the birds that particularly feed upon them is of vital interest not only to the farmer but should also be to each one of us, for it is estimated that insects cause a loss yearly of more than $700,000,000 to the agricultural interests of the United States. Were it not for the protection of birds, this loss would be far greater.

You may travel many, many miles without seeing a conservation agent who guards the birds and animals, but how far can you go without meeting a child? And each child can do its share in many ways, to protect these good friends, the birds, the fish, the animals and their homes because the prosperity of our great nation depends on it.

Today, there is the greatest need of bird protection; the cutting away of our abundant timber tracts and intensive cultivation is depriving the birds of many of their natural homes so it is the duty of every thinking man and woman to do all in their powe rto substitute homes for those that our modern civilization has taken from them.

We should protect our birds from enemies as far as possible. The United States leads the world in good laws for the protection of birds, so what is needed today is for the public opinion to back up these fine laws and for the men and women of the country to study our birds, love them and see that children are taught both at home and at school to know and to protect our feathered friends. This will be an interesting and an elevating study now, and appreciation of our birds will have become a part of their being by the time they are men and women.

If we wish to see America lead the world in agricultural products, each and every one of us will have to do all in our power to conserve North American Bird Life For Future Generations.

Why North American Birds Should Be Conserved For Future Generations

By JAMES O. STAMPLEY, N. O., La.

J. W. Hoffman School

One of the great problems confronting agriculturists indirectly is the protection of bird life, in that by doing so they will free the crops from the ravages of the insect pest. The loss sustained by the destruction of cereal crops, by the defoliation of the forest shade and ornamental trees, as well as by the attacks upon the bodies of the trees by the borers, by the denuding of our flower and vegetable gardens, and the destruction of our vines and small fruits, runs into many millions of dollars annually, all of it being the work of insects.

Ornithologists as the result of years of careful study and of thousands of experiments, have established a number of surprising facts. It is known of course, that food of nestling birds consists almost entirely of insects. Almost every bird has a certain kind of insect it fancies or likes most. For instance the Flicker eats thousands of ants and almost a thousand of chinch bugs daily. Our potatoes are protected from the potato bug by the birds. Thousands of these bugs and grasshoppers are eaten daily. Of course it is true that some varieties of insects are beneficial and it is also true that insects prey upon other insects causing the destruction of countless numbers. The rate of increase however, in the insect world is almost unbelievably rapid, the progeny of a single pair of some species unmolested, numbering many millions in a season. We have it on the authority of eminent economic ornithologists that the increase of insect life would be so appalling that in a short time all vegetation would be destroyed were it not for our wild bird life.

As a result of this fact I am told the conservation officials of North America, ever on the alert to adopt any new idea which promises to aid in the conservation of the wild life of the states, are now seriously thinking of associating the farmers in their never ending struggle to preserve the birds of this country from the inevitable extinction which would occur should the department relax its vigilance. If the farmer can raise eggs from poultry, he can also raise eggs from wild birds, and as this natural increase occurs, the farmer could add very materially to his income by selling these birds.

Wild life, thus conserved by the farmers' cooperation, would increase much more rapidly than it would even in its natural habitat, because in the latter case it would be open to the ravages of its natural enemies, which would be eliminated to a large extent on cultivated lands. In these days when everybody is talking about the high cost of living, especially in the matter of food, any enterprise that aims at a larger production of food stuffs will be viewed with the most manifest approval. There are but few diets that may compare with food furnished by the farmer and birds. The farmer in his scheme has absolutely nothing to lose and everything to gain. His duties to his wild life guests will not at all interfere with his regular avocation, but will nicely dovetail with it.

Also, aside from this practical aspect of the scheme, the farmer would have the comforting and satisfying thought that he is doing a worthy work as a citizen and a conservationist, that he is benefitting innumerable people, adding to his own income, and really improving his farm property and making it more valuable, that is, worth more money per acre than it was before. A general movement of this character throughout the states by farmers and planters would actually add to the prestige of the entire commonwealth, beside in some degree adding to its wealth. Then you can see the conservation of bird life is as important as transportation, gas, licenses, supplies, food, shelter, all kinds of necessities, as well as souvenirs and luxuries.

From what I have said in the preceding paragraphs one can easily see how pleasant the birds make life. The work they do, their beautiful songs, all add a note of beauty to surroundings. Then let us help them to conserve their lives and life will be more enjoyable.

Why North American Birds Should Be Conserved For Future Generations

By EARL THORNTON
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After the creation of man, the Creator thought it wise to create things for man's comfort. Among the greatest of these creations were the birds. Some of these birds were created for the pleasure of man, some for food and others were made to destroy insects that destroy crops, fruit and forest trees. Man was made ruler over all the living things and it was expected that man would have wisdom sufficient to conserve and protect them through all times. History teaches that this privilege given man has been abused; man in all ages has shown a disposition to destroy rather than conserve.

Birds should be saved, first from a humane point of view, because all living things love their life and the second and greatest reason why they should be saved is, that future people should not be robbed of the pleasure of knowing intimately all the things that God created for their benefit and pleasure. Birds have furnished food for man since the beginning of time, protection to his crops and have furnished song for his pleasure. It is wisely said that if all bird life were destroyed, within the next five years all living trees and crops would be destroyed by insects. The greatest thing for the conservation of bird life in this country would be the teaching of this subject in all schools, impressing the importance of birds on the minds of the children who will go home and influence their parents in saving the birds.

Bird reservations should be established and every home should be a bird home, a place where they may find food, water and protection from prowling cats. Many things destroy birds and their nests. Possibly forest fires take a larger toll of young birds and destroy a greater number of nests and eggs than any other one thing. Boys with small guns and sling shots take their toll. Man has used birds as a target since the invention of guns, but through the efforts of bird lovers and laws against the ruthless destruction of birds, less and less birds are being killed in this way. All wild life should be protected not only for our present use and pleasure, but that future generations may see and enjoy God's great gift to man; otherwise they will read of these beautiful beings and wonder why they have been robbed of this great heritage by those who came before them.

CANNED SALMON RANKED HIGH AS ECONOMICAL FOOD

(*Continued from page 2*)

Fish is all tender, as there is very little connective tissue to break down as in the case of meat. Consequently it falls apart easily when cooked. The flavor of fish is delicate and for variety it is often cooked in fat and served with acid foods, like lemons, tomatoes, and slaw.

Marine fish are rich in iodine and are especially valuable as food in certain disorders of the thyroid, Mr. Manning says. All fish contain important minerals and large amounts of protein, the substance which builds tissues and supplies energy to the body.

Like lean meat, fish, with the exception of fish oils, is not considered an adequate source of vitamins. Salmon oil compares favorably with medicinal cod liver oil in the content of Vitamins A and D. Recent research in the Bureau of Fisheries has shown that other fish oils are excellent sources of Vitamin D, a fact which Mr. Manning predicts will, in time, make it possible for this country to curtail its large importation of cod liver oil.

Canned salmon is one of the principal fish products from the standpoint of nutrition as well as economy. It is one of the few foods from which it is possible to get Vitamin D, the antirachitic vitamin, and it is outstanding among fishes in its fat content. It also contains Vitamin G, which is the foe of pellagra.

The large canned sardine is also higher than most fish in fat content, and since it is usually packed in tomato sauce it is a valuable addition to the diet.

The earliest ways of preserving fish were smoking, salting, and a combination of the two, Mr. Manning explained. Though not so popular as at one time, because of the advent of freezing and refrigeration, smoked and salted fish still are much in demand. With these methods of preserving, the nutritive value of fish remains unchanged.

Commercial Production of Menhaden Fish Oil for Animal Feeding

BY ROGER W. HARRISON
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and
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UNTIL the past year (1930) menhaden oil had been considered solely as a commodity for industrial use, such usage being founded upon certain physical and chemical properties of the oil which make it applicable to several industrial processes. Owing to the degree of unsaturation of the glycerides of the fatty acids composing the oil it is accepted as a semi-drying oil and finds usage in certain types of paints, varnishes, enamels, and in the manufacture of linoleum and felt base paper. Owing to the flexibility and water resistance of the oxidized film, it is also considered a desirable vehicle to be used in the manufacture of waterproof fabrics. With the introduction and development of the process of hydrogenation it was found that the oil could be converted to a desirable soap fat and now large quantities of the oil are used for this purpose. In addition, small quantities of this oil find usage in tempering steel, as a cooling medium for certain electrical apparatus, in the leather-tanning industry, and in the manufacture of certain rubber substitutes. Inasmuch as many other kinds of oil are suitable for the same purposes, it may be said that menhaden oil had no recognized property which would place it apart from the many competitive animal and vegetable fats and oils which influence its market value. No particular thought had been given to its biological value and consequent utilization in the field of animal nutrition.

Early in the year 1930 Nelson and Manning (1930) began an investigation of the vitamin potency of various fish body oils which are produced in commercial quantities in the United States. The results of this work indicated that the vitamin D potency of several of the oils investigated compared favorably with that of medicinal cod-liver oil, the sample of commercial menhaden oil tested being 75 per cent as potent.

Technologists of the Bureau of Fisheries thought that it might be possible to improve the vitamin potency of these oils if certain changes were made in their manufacture. Accordingly several samples of menhaden oil were prepared by the authors by different methods of processing and submitted for biological assay. The results obtained by Manning, Nelson, and Tolle (1931), who studied the experimental oils, disclosed that the vitamin D potency had been improved to such an extent that menhaden oil, if properly prepared, is open to a new and more lucrative market in the field of animal nutrition.

In order to appreciate the possibilities of menhaden oil in the field of animal nutrition the following statistics may be cited. According to Fiedler (1931) the 37 menhaden factories operating during the fishing season of 1929 and 1930, manufactured 3,172,735 gallons of menhaden oil valued at $1,381,816. The production of crude cod-liver oil in the United States during 1929 amounted to 264,809 gallons only, valued at $184,284. According to statistics published by the Bureau of Foreign and Domestic Commerce,* approximately 5,000,000 gallons of cod oil and cod-liver oil were imported into the United States during the same year. Although no data are available it may be assumed that a considerable portion of the imported oil was utilized in animal nutrition. Thus menhaden oil, if properly prepared for feeding purposes, may be expected to help supply a domestic market requirement which is now met largely by a foreign manufactured oil.

EXPERIMENTAL PROCEDURE

In describing the method by which the various samples of oil were prepared, the authors have chosen to identify them according to the sample number given during the biological test. The reason for this procedure is to eliminate any possibility of confusion in associating the technical discussion of this paper with a more complete discussion of the biochemical work on the oils which is reported by Manning, Nelson, and Tolle (1931). Consequently, in selecting the most logical order for describing the technical preparation of the samples it has been impossible to list them in numerical sequence.

Preparation of the Oils Studied

Sample No. 7, which was obtained from one of the Reedville menhaden factories, represents the typical menhaden oil of commerce as produced in the Chesapeake Bay district. The method of preparation, which is the typical factory procedure, is as follows: The fish are cooked with live steam for a period of about 15 minutes in order to free the oil from the fatty tissue of the body. Inasmuch as no particular measure is made of the steam pressure used it is impossible to state the exact temperature to which the fish are subjected during the cooking operation. The cooked mass, including the water from the steam condensed during the cooking process, is then passed to a continuous screw press where the free oil and moisture are expressed. The press liquor, consisting of free oil, oil in water emulsion, and water containing dissolved and suspended solids, flows from the press floor to a series of separating tanks where the majority of the suspended solids settle out and the oil and emulsion rise to the surface. This part of the process generally requires from 3 to 6 hours and the average temperature of the liquids may be expected to be about 160° to 170° F. When sufficient gravity separation has taken place the portion of the liquor rich in oil is floated to cooking tanks, where it is heated with live steam or closed steam coils for a period of several hours. As a result of this heat treatment the emulsion is broken and the freed oil is then skimmed to storage, where it is kept in large open tanks until shipped to market.

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*Foreign Commerce and Navigation of the United States, 1929, vol. 1, p. 486.

In summarizing the treatment of the sample tested it may be said that the oil had been subjected to a temperature of over 212° F. for a period of at least 15 minutes while intermingled with the flesh of the fish, had been in contact with the air and subject to oxidation at an average temperature of about 160° to 170° F. for 3 to 6 hours, and finally had been subjected to another heat treatment for several hours at a temperature exceeding that of boiling water.

Sample No. 5 was prepared at the labratory from factory press liquors. The oil, therefore, had been subjected to the factory cooking and pressing operations. A quantity of press liquor was taken as it flowed from the press floor and immediately removed to the bureau's laboratory where the oil was separated from the remainder of the liquor by means of a small laboratory centrifuge.

Samples Nos. 8 to 12, inclusive, were prepared in the laboratory from the same lot of fish according to varying methods of manufacture. This was done in order to produce an oil as it appears in the raw fish and to obtain samples which represent oil as it appears at the different stages in the factory reduction process. From such samples it was hoped to obtain a measure of the effect of the various operations on the vitamin potency of the oil.

Sample No. 8 was obtained by extracting oil from fresh raw fish with ethyl ether. The solvent was then separated from the oil by distillation at a low temperature under reduced pressure.

Sample No. 9 was prepared in a manner that should make it identical with sample No. 5 except that the cooking and pressing operations were performed at the bureau's experimental laboratory and the supply of fish were caught at later date during the menhaden season. The fish were cooked for 15 minutes with live steam at a pressure of 15 pounds per square inch maintained in the small experimental cooker. The oil was then expressed from the cooked fish by means of a small hand-operated press and spun from the liquor in the laboratory centrifuge.

Sample No. 10 was prepared from a portion of the same press liquor used for sample No. 9, except that the liquors were permitted to stand about 6 hours at a temperature of from 170° to 180° F. The oil was then separated from the emulsion, which had risen to the surface of the container, in the laboratory centrifuge. The sample, therefore, should represent the factory process up to the point where the rich oily mixture is floated to the cooking tanks and, in comparison with sample No. 9, should give a measure of the effect of the gravity separation in the factory separating tanks.

Sample No. 11 was prepared from a portion of the liquors used for sample No. 10. In this case, however, the oil emulsion was broken by a 2-hour heat treatment instead of being spun in the laboratory centrifuge. The sample, therefore, represents the complete factory reduction process as duplicated in the laboratory and in comparison with sample No. 10 should give a measure of the effect of the factory method of breaking the emulsion in the cooking tanks.

Sample No. 12 represented a portion of the oil prepared as sample No. 11, except that it had been exposed in an open container on the roof of the bureau's laboratory for a period of 40 days before being submitted for test. Sample No. 12 should represent commercial menhaden oil ready for market 6 weeks after being extracted from the fish.

Samples Nos. 4 and 6 represent oil prepared by a dry-rendering process. This method of reduction is little used by the oil-fish industries since the equipment is quite expensive and has low unit capacity. It does have certain advantages, however, in that a greater recovery of manufactured products are obtained. The fish were placed in a steam-jacketed clyinder where the moisture was driven off at low temperatures under reduced pressure. During the drying operation the oil is cooked out of the oil cells and may be removed from the dried material by pressing in high-pressure pressing equipment or by solvent extraction.

Sample No. 4 was expressed from the dry-rendered fish in a small hydraulic press.

Sample No. 6 was removed from the dry-rendered material by means of a suitable fat solvent.

Biological Assay

The results obtained from the biological assay of the oils described in the preceding section are shown in Table 1 in the order discussed. These data are compiled from the report mentioned above by Manning, Nelson, and Tolle (1931). In studying the oils these investigators used a standard grade of medicinal cod-liver oil as a comparative control. The vitamin D potency of the standard sample was arbitrarily considered as 100. Consequently the samples of menhaden oil which were given a value of 100, can be considered equal in vitamin D content to the best grades of medicinal cod-liver oil.

TABLE 1.

Free fatty acid content and vitamin D value of several samples of menhaden fish oil.

Sample	Free fatty acid content* per cent	Vitamin D value
No. 7	1.05	75
No. 5	.92	100
No. 8	1.30	100
No. 9	.28	100
No. 10	.39	100
No. 11	.40	75
No. 12	.98	75
No. 4	5.20	75
No. 6	5.30	75

*Calculated as per cent oleic acid.

Discussion

In order to facilitate a discussion of the experimental results the nine samples of oil have been divided into four groups. Group I includes sample No. 8 alone. Since this sample was obtained from fresh raw fish by extraction it may be considered as representing as near as possible the oil, with its natural vitamin value, as it actually appears in the fish. Accordingly it may be taken as a basis to which the remaining samples may be compared. Group II includes samples Nos. 7 and 5, which are of factory origin. Group III includes samples Nos. 9 to 12, inclusive, which represent the various steps in the reduction process as obtained on a laboratory scale. This group duplicates Group II in that sample No. 11 is comparable in method of manufacture with sample No. 7, and similarily sample No. 9 may be considered comparable with sample No. 5. The additional samples in the group, namely Nos. 10 and 12, permit a more refined measure of the effect of each step in the reduction process. Group IV includes samples Nos. 4 and 6 since these were prepared by a dry rendering process instead of the wet.

The value of 100, which was assigned to sample No. 8 as a result of the biochemical tests, indicates that menhaden oil as it appears in the fish is at least equal to cod-liver oil in vitamin D potency.

According to the data, the vitamin D value of sample No. 7 was found to be 75 while that of sample No. 5 was found to be 100. From reference to the method of preparing the samples, it is seen that both were subjected to identical treatment up to the point where the liquors flowed from the press floor. The destructive effect on the vitamin value of sample No. 7 may be attributed, therefore, to the treatment received in the separatory and cooking tanks, since sample No. 5 was obtained by immediate mechanical separation of the liquors coming from the press floor. Also, the vitamin D value of sample No. 5 was equal to that of sample No. 8 which represents, approximately, the natural oil in the fish.

Inasmuch as the data obtained from Group II indicate that the destructive effect on the vitamin value could be attributed to one of the two remaining steps (gravity separation, and heat treatment in the cooking tanks) in the reduction process, the samples in Group III offer a more accurate check as to the exact operation responsible. As stated previously, sample No. 9 of this group was comparable with sample No. 5 of Group II in method of manufacture. Accordingly, it is interesting to note that both samples were found to have a vitamin D value of 100.

The method of preparation of sample No. 10 of Group III as described, was so planned as to permit a measure of the effect of the treatment received in the gravity separating tanks. The vitamin assay, as given in Table 1, shows that this operation has little or no destructive effect on the vitamin value. By process of elimination it may be assumed, therefore, that the destruction of the vitamin value takes place in the cooking tanks. This is substantiated by the data on sample No. 11, since this sample had been subjected to the heat treatment for breaking the emulsion, and as was found in sample No. 7, the vitamin D value had been reduced to 75. The results obtained from sample No. 12 indicate that the short period of exposure had no noticeable additional effect on vitamin D. The biological values determined for samples Nos. 4 and 6, constituting Group IV, show that the dry rendering process for reducing menhaden is destructive to vitamin D.

A study of the acid values of the several samples of oil tested suggest several interesting points for brief consideration. Although the rate is not pronounced, it will be noted that there is a definite increase in the acidity of samples Nos. 9 to 12. The greatest increase can be attributed to exposed storage and the time when the oil was in the separatory tanks. Although neither of these steps caused an apparent decrease in the vitamin D value of the oil, they are factors to consider when it is desired to produce low acid oil. The fact that there was no appreciable difference between the vitamin potency of samples Nos. 4 and 6, and samples Nos. 11 and 12, in spite of the considerable difference in acidity, should not be misconstrued by the reader. In the case of samples Nos. 11 and 12, the increase in acidity may be considered as the result of hydrolysis of the fat under practically sterile conditions. Had this same increase been caused by hydrolysis, due to oxidation and resultant decomposition, a lower vitamin value would no doubt have resulted. It is possible also that the lower acidity of oils made by the wet rendering process is due to the fact that some of the acids formed are water soluble and are dissolved out in the waste water of the liquor. The relatively high acidity of sample No. 8 as compared to samples Nos. 9, 10 and 11, is attributed to the length of the extraction period required to remove sufficient oil for sample and the difficulty encountered in removing the solvent from the extracted oil.

Inasmuch as samples Nos. 7 and 5 were not prepared from the same lot of fish as the remaining samples, their relative acidities can not be interpreted.

APPLICATION OF EXPERIMENTAL METHODS TO COMMERCIAL PROCEDURE

The data discussed in the preceding section discloses that the greatest destructive effect on vitamin D during the reduction process may be attributed to the present method of breaking the separated oil emulsion by treatment with heat in the oil-cooking tanks. Menhaden operators who desire to produce oil of higher vitamin potency therefore should take steps to eliminate this operation from the factory process. To do this and accomplish the separation rapidly it will be necessary to resort to mechanical separators of the centrifugal type. In this connection, however, the operator is faced with at least two technical problems which must be overcome: (1) The suspended material present in the liquor will plug centrifugal oil and water separators, and (2) the unit capacity of the equipment now used in the menhaden industry is much greater than the unit capacity of centrifugal separatory equipment. The first-mentioned problem will receive attention in this report, but it is preferred that the matter of the relative capacity of the equipment be left to the individual operator. He should be in the best position to know whether it would be more desirable, in his case, to reduce present unit capacity to fit a moderate amount of mechanical separatory equipment or to install a sufficient amount of such equipment to meet present plant capacity. In any case intermediate storage of the liquor, during the process of separation, should be avoided because methods suitable to prevent fermentation and decomposition of such a mixture may be expected to have a deleterious effect on the vitamin value of the oil.

In order to guide menhaden operators interested in producing oil of higher vitamin D potency the following possible methods of procedure are suggested for consideration. The number of individual pieces of apparatus used, as stated, will depend upon the operator.

The first method would require the use of (a) a mechanical screen to remove the majority of the suspended solids, (b) a centrifuge which gives a 3-phase separation, and (c) a centrifugal oil purifier. The use of this equipment in the order mentioned will permit a complete and rapid separation of the press liquors flowing from the press floor. Experiments conducted by technologists of the bureau have shown that as much as 80 per cent of the suspended solids present in the liquors can be re-

(*Continued on page 37*)

Federal Conservation of Oil Credited With Saving Millions

Much Waste Eliminated at Slight Cost, Department of Interior Says in Summarizing Activities.

THE first attempt of the Federal Government to aid a major industry in curing an economic ill has met with much success through the work of the Department of the Interior in promoting conservation of oil and natural gas, according to a statement made public at the Department June 5.

This reviews some of the activities of the Government with respect to oil and gas and recounts savings amounting to millions of dollars. The statement follows in full text:

During the fiscal year 1930, over $4,000,000 was paid into the Treasury for royalties accruing on public land alone, while over $1,500,000 accrued as royalty from Naval Petroleum Reserves in California. Royalties accruing from oil and gas produced on Indian lands were received by that office. The cost of this supervision to the Government was less than 3.7 per cent of the total income.

Among the numerous activities of the Conservation Branch of the Geological Survey is the prevention of waste caused by improper casing or abandonment of wells. Congress during the past three years has made appropriations totaling $150,000 for the purpose of plugging wells which negligent operators have failed to abandon. These funds have been expended under contract, and damage to oil, gas and water strata has been prevented.

In Wyoming, an oil company neglected to abandon a well flowing 5,000 barrels of water daily. This well was repaired and then included in a public water reserve so that it would be available for use as stock water or for irrigation purposes. In Montana, another oil company failed to abandon a well adjacent to producing gas territory. This well, flowing 15,000 barrels of warm sulphur water daily, will be repaired to prevent damage to oil or gas deposits and the water will be utilized in a bathing pool, to be constructed by the American Legion. These are but two examples of the several hundred wells on public land which have been abandoned in conformity with the Department's policy of conservation and the prevention of waste of the natural resources.

In the State of Oklahoma, in cooperation with the Office of Indian Affairs, the engineers of the Conservation Branch of the Geological Survey, which supervises oil and gas operations through a co-operative agreement with that bureau, have made it possible through the application of sound engineering principles, by mudding off or casing off depleted gas sands, deepening oil wells and by requiring a reduction in the amount of gas produced with each barrel of oil, to effect savings ranging approximately from a few hundred dollars to as much as $5,000 daily.

In New Mexico, the location of Government land adjacent to State-owned lands has resulted in close cooperation with State authorities, and advocation of the principles of conservation has changed public opinion to favor proration. This proration agreement has been signed by the majority of operators and the benefits derived from this agreement are conservatively measured in terms of hundreds of thousands of dollars and may reach $1,000,000 if the agreement is in force for one year or more.

The Salt Creek field in Wyoming was an early example of an oil field comprising a large amount of Government lands which has been developed under careful supervision. Although now a well-developed field and favored by a minor division of lease ownership, the necessity for consistent supervision was exemplified during the past year. Seventy wells in this field showed a daily gas waste of 5,574,000 cubic feet. This waste of gas evaluated on the basis of its gasoline content and of dry gas showed a loss equivalent to $1,114 occurring each day. The report of this natural gas waste resulted in several conferences with the company officials and brought about such changes and repairs in the company's gas collecting system that the waste of natural gas was completely eliminated.

Baxter Basin Fields, Wyo., and Hiawatha Field, Colo., are of direct interest to the people of Salt Lake City and Ogden, Utah. Through the efforts of the Department, a cooperative plan of development was initiated which would insure these cities and other towns along the pipe-line route of a continuous and constant source of supply of this cleanest of all fuels. The plan also provided for the restriction of production of oil which might be obtained in the course of development of this vast area. This pipe line, constructed at an estimated cost of $22,000,000, will supply cheap fuel to these towns.

In eastern Montana, a geologic structure approximately 72 miles long and from 3 to 5 miles in width extends into southwestern North Dakota. This is known as the Cedar Creek Anticline. Pipe lines have been completed to supply gas to neighboring towns. Approximately 110 wells have been drilled, all of which are gas wells. Gas is found at a depth of 800 to 1,000 feet and the average daily production per well is from 1,000,000 to 5,000,000 cubic feet. An attempt is being made to bring about unit operation or cooperative development of this field, in order to eliminate unnecessary drilling and development of gas in excess of current needs. The enactment of legislation by the last Congress will enable the Secretary to enter into an agreement with lessees or owners looking toward unit operation.

During the past year, notable developments involving public lands were the extension of natural gas distribution systems increasing the utilization of this natural resource and providing the States concerned with revenues which were not possible without the enterprising management directing the activities of the oil and gas companies. An added amount of gas was made available for fuel by the adoption of a plan of production by operators through advice or insistence of Geological Survey engineers that only the necessary amount of gas to lift the oil to the surface be produced.

The proper ratio of gas to oil has been the subject of legislation in several States. The Secretary has endeavored through various means to control the production of both from Government lands, to suit the current demand and pipe line or other facilities available.

Conservation is further encouraged on Government lands by allowing the lessee to retain two-thirds of all gasoline extracted and computing royalty on the remaining one-third. This extremely liberal policy has led in the past to the installation of plants for the extraction of gasoline from natural gas when otherwise such plants would not be erected. In several fields, the "dry" gas resulting from extraction of the gasoline content of a "wet" or casinghead gas has been either stored in depleted sands or pumped into partially depleted zones and recycled through the gasoline plants.

Of prime importance to the people of the Nation and of immediate concern to the people of California, particularly those engaged in the oil business, is the development of the Kettleman Hills Anticline. A gross market value of the contents of North Dome is approximately $6,000,000,000 to $7,000,000,000. It is acknowledged that the present market value of the oil is about half of the assumed value and the figures here quoted are given to acquaint the reader with the immense value of this field.

Under the direction of the Secretary, a cooperative or unit scheme of development was adopted pursuant to authority granted under the act of March 4, 1931. Thirteen companies owning different leases combined their holdings and agreed to operate their lands as a unit. This newly organized company is known as the Kettleman North Dome Association and it holds 10,800 acres of the 21,200 acres which have prospective value, the remainder being operated as a unit by the Standard Oil Company of California.

The far-seeing management of the companies involved are to be congratulated in aiding the Secretary to bring about this cooperative development, thus avoiding the distress to oil producers of the Nation which a glutted gasoline market causes.

Under the present scheme, the field will be developed according to market demands, thus conserving for future generations the enjoyment of an adequate supply of gasoline at reasonable prices without injury to those who have invested in the oil business.

Far-reaching is the significance of the first attempt by the Federal Government to aid one of the largest of the country's industries in curing an economic ill which has been the outgrowth of lack of consideration by landowners of the importance of conserving an irreplaceable natural resource, and of the restrictions on joint ownership and development imposed by law. In other countries where the subsoil belongs to the crown or to the National Government, and where concessions of great areal extent are granted, none of the manifold complications such as arise in the United States from a multiple division of ownership of mineral rights, are likely to exist. This fact has made it possible in most cases for the oil operator to plan his development in advance and to produce oil according to his needs and at a much lower cost of production.

Aside from conserving our supply of petroleum as a means of national defense, the people of the United States must be brought to realize that in maintaining our leadership in the world production of petroleum, which during the past year was 70 per cent of the total, we have also depleted our reserves at a rapid rate.

The legislation of March 4, 1931, applying to oil and gas, is a means of controlling supply and conserving this irreplaceable resource and it is hoped that the State Governments of the various oil producing States will follow the example of the Federal Government in conservation of the source of supply of this important commodity.

Economic Value of Utilizing Land Areas for Forests

Governor of Georgia Discusses Practical Importance of Products Which May Be Derived From Different Types of Trees.

By

L. G. HARDMAN

Governor, State of Georgia

Most of us, when we think of trees, think in general terms. A felled tree is a source of lumber, and a living tree provides either shade or fruit for human consumption. It seldom occurs to us that the uses of trees, growing or cut, are widely varied and dependent on the kind of tree. Failing to comprehend the value of forest trees while they are alive, we may think of forest conservation as a sort of self-sacrificing act, whereby we forego immediate profit in order that the next generation may have sufficient lumber for the manufacture of necessary articles.

A brief examination of the uses of trees will show that this attitude is a mistake; and I shall call especial attention now to the hardwoods, which are among the most valuable trees, and which grow more rapidly in the southern section, especially in Georgia.

The value of the fruit of our forest trees as stock food is one that is too frequently overlooked. In Georgia we have numerous fruit-bearing hardwood trees. Too many of us destroy these trees that produce berries, acorns, chestnuts, chinquapins, etc., and then after the land is cleared we plant crops of corn and peanuts to supply hogs and cattle the nutrition they might have had from the tree fruits.

More than 20 years ago I planted honey locust, black locust, persimmon, mulberry and black walnut trees to furnish feed for stock, and at the same time to grow timber for industrial uses. Some of the trees I have found very serviceable as feed, because their fruits ripen at seasons when there is no grazing crop.

Reforestration of the hardwood trees will furnish one of the most valuable and profitable incomes that can be had from the un-used or waste lands of the United States. The farmer can be greatly benefited by the growing of these trees; and it can become a most valuable and permanent investment for posterity—perhaps more valuable than stocks and bonds.

Examination of specific values of some of the trees of Georgia may be of interest. The pine is one of the most important commercial lumber-producing trees that we have in the South, as well as the oak, hickory and poplar. These all have a great commercial value and outlet. The black locust is one of the durable hardwoods—for posts, pins, and for cross-arms for telephone and telegraph lines. It is easily grown, either by planting seed or transplanting. While it grows in most any section, the mountainous section is preferable, and along the streams. This tree has a white bloom, which is beautiful, as well as having a honey-producing value. However, its principal market would be for posts, pins, cross-arms, sills, or foundations for bridges. These posts will last from 50 to 100 years; and if one planted 10,000 trees to 100 acres, we readily see the tremendous "crop" he would have.

The wild persimmon grows practically without attention on waste lands, and within 15 or 20 years, produces a splendid timber crop. According to weights that I have estimated and measured, an average tree bears 720 pounds of fruit annually. Ten thousand trees, which would not cover more than 100 acres would thus furnish 720,000 pounds of valuable feed for cattle, hogs, sheep and colts. As the fruit contains 5 to 20 per cent of sugar, depending on the variety grown, its nutritive value is high. The pulp and seed are ground before feeding. If the persimmon is harvested before it ripens it has a high content of tannin, or tanic acid, which is valuable in the process of tanning leather.

The possibility of producing sugar commercially from the fruit is an alluring problem for experiment. If the sugar content is 20 per cent we might have, besides our cattle feed, 1,440,000 pounds of sugar from 100 acres. If this sugar should prove to be of commercial utility, a helpful industry might be added to the South, at least, the magnitude of which may be seen when we compare the sugar content of the persimmon with that of the beet. When Napoleon, in 1801, suggested making sugar from beets, about 6 per cent was the estimated yield of beet sugar.

An apparent objection that the persimmon seed would be difficult to remove, might be overcome by the cultivation of a variety which has been found in Banks, Habersham and Jackson Counties, Georgia, and which is seed-

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Providing Information on Bird Life

Work of State Ornithologist in Massachusetts.

By
DR. JOHN B. MAY
Director, Division of Ornithology, Department of Agriculture, Commonwealth of Massachusetts

THE QUESTION is sometimes asked, "Just what is a State Ornithologist?" The position can be likened to Topsy of "Uncle Tom" fame, who "never was born, but just growed up." It has developed slowly through a series of years, as the result of the steady increase of interest in birds and in the study of their economic importance.

About 40 years ago Massachusetts was in the throes of the first attempt to control the newly-established gypsy moth, a European insect pest which has cost the New England States many hundreds of thousands of dollars in the last two decades.

Edward Howe Forbush, a well-known naturalist, was appointed superintendent of gypsy moth supression by the Governor, to work under a commission. As the problem was a new one, Mr. Forbush studied the life history of the insect very thoroughly in order to be able to plan a campaign, and in the course of his field research found that many different kinds of birds fed upon the gypsy moths at some stage of their existence.

Largely as a result of this work, Mr. Forbush was subsequently appointed as consulting ornithologist to the State Board of Agriculture and carried on various investigations into the economic relations of birds and man. In 1908 he was officially designated as "State Ornithologist." With the later reorganization of the various State boards into departments, a Division of Ornithology was established and Mr. Forbush became its first director, a position which he held until 1928 when, having reached the compulsory retirement age of 70 years, the present writer became his successor.

The State Ornithologist of Massachusetts is directed by law to "investigate the distribution and food habits of the birds of the Commonwealth, to determine as far as possible the relation of birds to outbreaks of insects and other animals, to experiment with a view to discovering the best method of protecting fruits and crops from birds, and to serve the Commonwealth in an advisory capacity in matters relating to the economic status of birds and legislation concerning them." He is also empowered to issue special reports and bulletins as the exigencies of his work require.

Much has been accomplished in carrying out the different requirements of this law, though much still remains to be done. The results have received publicity in the form of numerous departmental bulletins, newspaper and magazine articles, lectures, radio broadcasts, and through the medium of a vast amount of correspondence and personal interviews.

As indicative of the wide scope of this work, the following titles of publications of the Division of Ornithology are suggestive. They include "Birds as Protectors of the Orchard," "Birds as Protectors of Forests," "Birds as Destroyers of Hairy Caterpillars," "Birds Useful to Agriculture," "The Destruction of Birds by the Elements," "Two Years With the Birds on a Farm," "The Crow in Massachusetts," "Rats and Rat Riddance," "The Domestic Cat, Bird Killer, Mouser and Destroyer of Wild Life," "The Farmer's Interest in Game Protection," "Bird Houses and Nesting Boxes," "Food Plants to Attract Birds and Protect Fruit," "Food, Feeding and Drinking Appliances and Nesting Material to Attract Birds," "The English Sparrow and the Means of Controlling It," "The Starling," "The Natural Enemies of Birds," as well as numerous nature leaflets, Bird and Arbor Day programs, and reports.

The Division has also prepared and the Commonwealth published, a volume of about 500 pages on "Useful Birds and Their Protection," a larger one on "Game Birds, Wild Fowl and Shore Birds," and finally, a three-volume work, fully illustrated with colored plates of all species, on "The Birds of Massachusetts and Other New England States."

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EDUCATION---AN IMPORTANT LINK IN CONSERVATION

By FLOYD A. JOHNSON
United States Game Protector,
Louisiana District

WE MAY be able to dodge some present day issues which vitally affect the general public, but it seems we can no longer afford to pass lightly over the great importance that education plays and will continue to play in wild life conservation, as well as in influencing the public sentiment upon which this type of conservation depends very extensively.

What law has ever been a success, or strictly adhered to without first gaining for it the favorable sentiment of the public? Further, how can we swing public sentiment toward the support of the law? There appears to be but one way to successfully accomplish this, and that is by educating the people as a whole that the law is necessary—and why it is necessary.

No conservationist or lover of wild life need be told that our once rich heritage in this line is fast declining; these facts are too boldly written at every turn of the road, the stream, and woodland edge to require this. We of the present generation cannot readily comprehend the multitude of wild life that was enjoyed by our fathers and grand-fathers in the early days of North America, and far too many of us are neglecting to visualize what conditions are likely to be in a quarter of a century hence.

Who of us are to suffer most from the depletion of our forests, fish, bird and animal life? Isn't it going to be the young people of the present day? Therefore, if they are to go through the sad experience of witnessing the decline and possible depletion of our wild life, should not they more than any one else be prepared for the ordeal? Should they not be taught the fundamental principle of conserving the remnant of that which was once abundant and which we will undoubtedly leave in their charge?

Any man who loves his son, or who regards his future business success, or recreation will not suffer his boy to kill insectivorous birds or rob their nests, nor will the father himself violate any State or Federal law in his taking of game birds or animals. A father should be a pal to his boy; a partner in whom the boy can trust for wholesome guidance. In fact, the first rudiment of education should be imparted to the boy by his father, and as to this early education being of a lasting and beneficial nature, that is left entirely up to the father. Most boys do not fully appreciate this early training until their father has passed over the Great Divide, however, as the boy advances along the pathway of life, much of this early training will exert itself. A boy is the greatest imitator imaginable, therefore, it behooves the father to always set good examples in sportsmanship and conservation before him.

When the boy is in school, he is more or less under the constant supervision of his teacher and of course, during this period his life is more or less molded into what it will eventually attain in the business world; consequently this is the point which I desire to put considerable stress upon. We of course realize that reading, writing and arithmetic are vitally important in one's life work, however, there is also something else equally important, and that is health. To have health we must also have wholesome out-door recreation, and to enjoy proper out-door recreation, we must have some incentive that will cause us to go into the great out-doors; that incentive is usually either fish, birds, animals, trees, flowers or numerous other life, which is found associated with the wide open spaces. Therefore, we can quite easily comprehend how important all wild life is and also how vitally important it becomes that we maintain all the various species of wild life in as great an abundance as is humanly possible; to do this, we must teach the general public to understand the great good that wild life performs for them, especially in their immediate locality.

The State of Louisiana is to be highly commented upon the great educational campaign that is being accelerated by its Department of Conservation, under Commissioner Maestri and his able associates. When a man knows that he is doing a great work, it becomes a pleasure to carry it through to completion, and this, Commissioner Maestri will do if given the proper public support He has launched upon an educational campaign to show the people of Louisiana that their natural resources and wild life is well worth maintaining, and in this endeavor, he should receive the undivided support of all the people in the State. The sportsmen, nature lover, and Superintendent of Public Education, should lend every effort until conservation and its general principles is being taught as a regular subject in every school throughout the State. All teachers should be required to have at least some knowledge of wild life; certain natural history books should be provided as text books the same as other school books; a stated period should be set aside each week to be given over to field trips by the student body; constructive questions on wild life and conservation should be prepared by the teachers for their pupils. In other words let this all important subject be given the same diligent endeavor as any other regular school subject.

Personally, I would like very much to see Louisiana be the first and pioneering state in teaching Natural History and conservation in its schools, and do believe that with the proper support of the school officials and general public, Commissioner Maestri is the man who will be found wanting in this work; and should it become a reality, the people of the State will owe great thanks to the present Governor, Commissioner Maestri, and the State School Board.

Students should not forget that as time goes on positions will be open to them in conservation, and will no doubt be given the opportunity to make conservation their life work, and there is always room at the top for those who actually apply themselves.

Increase in Fishing in New Jersey Streams

"Get out and get under the sun." That is the advice of the New Jersey Fish and Game Commission to the man who may be worried by any phase of business depression. A hundred authorities, including Presidents of the United States, can be cited to prove that there is nothing like a fishing trip to restore physical and mental vigor.

The food value of fish in New Jersey's fresh and salt waters this year has become an item of unusual economic importance in tens of thousands of homes.

Reports of license sales during the trout and pike seasons, already open, have shown an enormous increase in the demand of the public for fish and fishing. Some trout streams have been fished out a half dozen times and as many times restocked since the season opened in April. Hundreds of truck-loads of big trout are still to be delivered from the fish hatchery.

Skeleton of Indian Is Found at Federal Fish Hatchery Site

A skeleton, presumably of an Indian, and a number of fragments of pottery supposedly buried with the Indian, were unearthed by workmen digging a trench at the federal fish hatchery site last week.

One of the men at work on the trench declared that he had found a deer's leg, and when others there saw it, they proceeded to find out just what it was. It turned out to be the bones of a man, the skull being whole and intact. However, some one not very interested bashed in the Indian's head. Pottery was dug up at various points on the site. The pottery, however, is quite rotten.

After seeing the find, a Times reporter called on Prof. George Williamson of the Science Department of the State Normal College to see if he could classify the skeleton. Professor Williamson said that it probably was that of a Nakitosh, a Cadaux, or a Natchez Indian. The Cadaux and Nakitosh tribes had, at one time, a big battle with the Natchez, nearly annihilating them. Professor Williamson also stated that he and Dr. George Stephens, now superintendent of the Arizona State Hospital for the Insane, some years ago made a search of the site, finding a number of completely preserved pieces of pottery, glass beads, and other jewelry.

Some more excitement was created down at the fish hatchery diggings when a trench which a number of men were digging caved in, nearly burying L. H. McGee, who was at work in the bottom of the trench. Other workmen said that McGee was barely able to get high enough to escape the rush of dirt.

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Pruning Young Loblolly Pine Trees Makes Timber Growing More Profitable

By BENSON H. PAUL
Silviculturist, Forest Products Laboratory,* U. S. Forest Service

THE VALUE of the lumber from second-growth, oldfield loblolly pine in North Carolina and Louisiana could have been increased by about $100 per acre had the trees been pruned early in the life of a stand.

In the stands studied by the Forest Products Laboratory it was found that the net profit per acre was directly related to the quality of the lumber as determined by commercial lumber grades. In these stands the average range in prices from the higher to the lower grades was from about $45 per thousand board feet for the lumber of the upper grades to $18 per thousand board feet for the lowest grade. In other words, the lumber of the highest grade was worth about two and one-half times as much per thousand board feet as that of the lowest grade.

In the second-growth loblolly pine stands the grade of the lumber is determined primarily by the number, size, and quality of knots. Good forest management, as handed down from early European methods, has sought to eliminate the lateral branches by growing the trees close together while young so that a dense shade would be produced and the branches killed through lack of sunlight. This so-called natural process requires a relatively long time and has a further objection from the standpoint of the timber grower; the trees, many in number, remain of small diameter until the stand is opened up to a considerable extent by thinning.

In America, high taxes, high interest rates on invested forest capital, high wages for labor, and the lack of suitable markets for thinnings make a short cut desirable in the production of high grade lumber. A method that has been talked about much and in a few cases put into use is pruning of the lateral branches of trees in order to insure earlier production of clear lumber. Pruning involves considerable labor and for the best results it must be done at a fairly early stage in the development of the stand. The pruning cost, therefore, must be carried over a considerable number of years before returns from the investment can be realized. An analysis of lumber cut from second-growth loblolly pine stands indicates, for this species at least, excellent possibilities of profit from pruning.

Let us assume, for example, that in the foregoing stands all of the trees which reached maturity had been pruned of side branches to a height of 16 feet when the stems were no more than 3 inches in diameter at that height. This would have made possible the production of a high percentage of the best quality lumber in the butt log of each tree, ranging from about 40 per cent to 90 per cent of the volume of the log, depending upon the size of the tree. Computations made on this basis show that, had this been done in the North Carolina stand 35 to 40 years ago when the trees were about 15 years of age, the average lumber yield in the B and Btr grade from an area of eight acres would have been increased from 8 per cent to 33 per cent; more than four times. The average net value of all of the lumber cut would have been increased $5.00 per thousand board feet and the average net value per acre of the lumber, not considering the cost of growing, would have been increased from about $160 per acre to $250 per acre.

Analysis of the lumber cut from 4½ acres in a Louisiana stand, 42 years of age, shows that pruning at the age of 15 years would have caused an average increase in the B and Btr grade from 2½ per cent to 42 per cent of the total. The net value of all of the lumber would have been increased $6.50 per thousand board feet and the average net profit per acre from the whole stand would have been changed from less than $3.00 per acre to approximately $100 per acre.

A difference of $90 to $97 per acre is not an inconsiderate amount in the business of timber growing. Discounted at 6 per cent compound interest there could have been permitted an expenditure of $9.00 to $12.00 per acre 40 to 35 years earlier in the North Carolina stand, and $23 per acre 25 years earlier in the Louisiana stand, when the trees were of a size suitable for such pruning. The actual cost of pruning by present methods is estimated at about $6.00 per acre, thus leaving a fair balance for profit in addition to the carrying charges for the work. The increases in value indicated for pruning could at the same time, and with little extra cost, have been greatly increased by thinning the more densely stocked portions of the stands so that the additional advantage of larger and fewer trees also might accrue.

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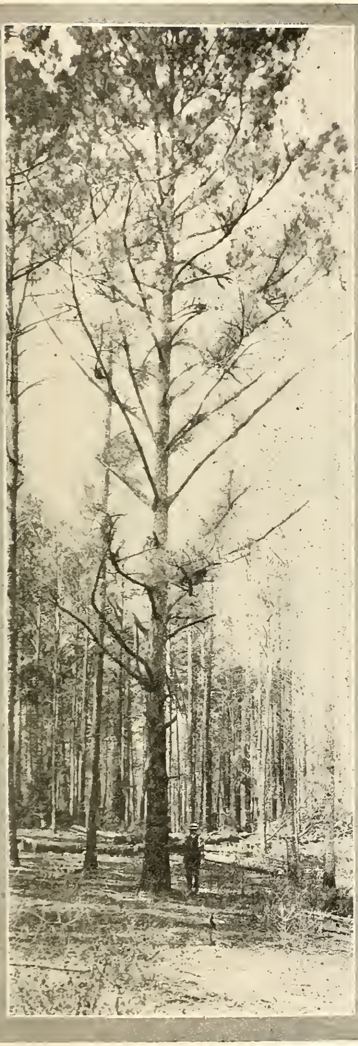
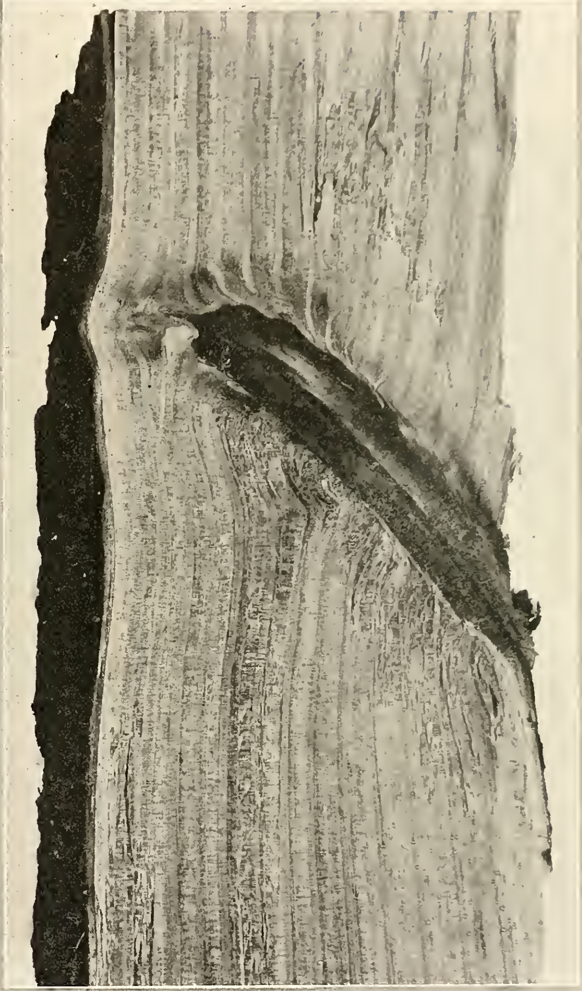
*Maintained at Madison, Wisconsin, in co-operation with the University of Wisconsin.



Loblolly pine trees 40 years old that produce only low-grade lumber because of many large knots.



Spike knot in young loblolly pine. Early pruning would greatly reduce the amount of lumber containing such knots.

Pruning young forest trees to a height of 16 feet presents, at first glance, a difficult task, especially for the portions of stems which can not easily be reached with ordinary tools by a man standing on the ground. However, the great possibilities of quality improvement and increase in value make urgent the need of further investigation of these possibilities and the development of tools better adapted for cheaper pruning than those now at hand.

For persons engaged in the business of timber growing this is an excellent method for increasing the capital value of their growing stock, since in this way a certain definite percentage of the final yield in timber of high quality can be assured. There are now many hundreds of acres of immature loblolly pine stands as well as of the other species of southern pine which could be improved by pruning and by thinning in the more thickly stocked portions.

Increasing the percentage of lumber in the higher and more profitable grades will materially benefit the lumber manufacturer since the percentage of lumber in the lower grades, often handled at a loss, is correspondingly decreased. This gives the lumber manufacturer a greater margin of profit.

Louisiana Nature Guardians

"Upon my honor, as a Louisiana Nature Guardian, I promise to take care of all our natural friends, to guard and protect them to the best of my ability, and as far as possible influence others to do the same."

WHEN the Nature Guardian Club of Louisiana was formed several years ago, it met an instant and hearty response from the teachers and the school children all over the State. From a small interested group it has grown steadily into a mighty force of thousands of young conservationists. These children are the proud possessors of handsome lithographed badges, and certificates of membership. New Clubs are being formed each week and it is the purpose of the Educational Bureau to enroll every Louisiana boy and girl, white or colored, under the Nature Guardian banner.

HOW YOU CAN BECOME A NATURE GUARDIAN

YOUR PART

Consult your teacher.

Ask that the purpose and plans of the Nature Guardian Club be explained to you and the class.

Ask for an application card.

Get a responsible person to indorse it, after proving that you fully understand the duties of a Nature Guardian.

Sign the application and mail the card, or give to your teacher, to send with cards from all the class.

OUR PART

We send the application card.

We send you a handsome badge, a certificate of membership, Nature Guardian pamphlets and other literature.

This is all free, and is carried on with the purpose of instilling into the children's minds a knowledge of Louisiana's wild life and a thorough understanding of its economic value to the State.

It also aims to develop individual humanitarianism. Even within this short time an amazing improvement has been made in the mental attitude of our young folks toward the conservation and protection of Louisiana's natural resources.

EDITORIAL

MY DEAR GUARDIANS:

We spend much time and energy to bring home to you the principles of conservation, and the urgent need that you take your Nature Guardian oath seriously.

We want you all to realize the necessity for our game, fish, and bird laws. We try to make you understand that every restriction imposed by our Department is an added safeguard for the insurance of future abundance of game and fish, for extensive forests, for smiling fields of plenty, and for myriads of birds, when your own generation reaches maturity and enters into the industrial, commercial, and civic activities of our State.

We most earnestly desire that you carry out each tenet of your Nature Guardian pledge, and try to influence others to do the same. We want to make you a generation of super sportsmen and conservationists.

Before we say good bye, let me ask all of the Guardians to send me accounts of the thrilling times you had this summer in camp or at home. The Scouts, both boy and girl, should have something especially interesting to tell us.

With love and best wishes for all of you,

Cordially yours,

THE EDITOR.

From "American Game Association News Service" we clip the following which should interest all Scouts. Please notice how the pledge parallels your own pledge:

The American Legion, the Lions Club and a deputy game warden at Toledo, Oregon, may have started a national movement among Boy Scouts, according to announcement of the American Game Association, when they enrolled the Boy Scouts of that vicinity in a wild-life conservation plan.

There are two Scout troops—and friendly rivalry has started between them. One troop is to major in Forestry and the other in Game and Fish Conservation. Tests of knowledge and practice are to be held each month, it is reported. The troops will switch from Forestry to Game and Fish Conservation and vice versa, thus each troop alternating, covering both fields.

Each Scout majoring in Forestry is to be made an Honorary Forest and Fire Warden, and each one majoring in Game and Fish Conservation is to be rewarded with the position of Honorary Game Warden.

Each Scout takes the following pledge:

"Upon my honor as a nature guardian, I promise to take care of natural friends—the birds, fish and all useful dumb animals, the flowers, the trees and the forest. I will do my best to protect them from abuse and hard usage.

"I promise not to rob a bird's nest, nor to wilfully kill a bird, an animal or a fish in violation of the law, nor to abuse or bully a dumb animal; and I will strive to keep others from doing these things, to the best of my ability. I will endeavor to prove myself a friend to all living things that are harmless.

"I will put out camp fires started by myself or others, and I will do my utmost to protect forests from destruction because forest fires not only destroy the trees and underbrush, but also burn birds and animals or their nests and dens.

"I will familiarize myself with the Game and Fish and Fire laws of my State so as to be able to govern my conduct and advise others, and in every way possible, I will do my best to protect the inhabitants of the great outdoors."

We are going to make all our St. Louis conservationists honorary members in the Club this month. We welcome L. Harrison, E. M. Strider, and Norman Richman into our midst:

St. Louis, Mo.
July 3, 1931.

DEAR EDITOR: I am a girl of twelve years in the eighth grade. I am very much interested in your Guardian Club, please send me the cards and the other things that I shall need to join.

I was afraid that my living in St. Louis would keep me from joining, but as I read a letter signed John P. Clark, I see I am eligible.

I have a girl friend thirteen years of age who is very good at poetry. I am sure she will be interested to place several of her poems about nature in your Louisiana Conservation Review. I am not very good at poems but will try to write a few essays on interesting information on Missouri. Hoping I shall receive a letter soon from Louisiana.

I am, very truly,
Miss L. I. Harrison,
1221 W. Grant,
St. Louis, Mo.

P. S. My girl friend is Miss E. M. Strider, 3706 Page Blvd., St. Louis, Missouri.

1435 Temple Place, St. Louis, Mo.

DEAR EDITOR: I am a boy of twelve years of age, and expect to graduate from one of the St. Louis grammar schools. If I live in St. Louis, does that keep me from becoming a member of your Club? I am greatly interested in the conserving of natural resources. If I can become a member, please send me an application card.

Very truly,
Norman Richman.

We welcome into our circle the following, and hope they will write to us often:

Berwick, La., Box 47.
July 1, 1931.

DEAR EDITOR: Since I have been reading the Conservation Review I have learned very much about the natural resources, forest products, fish, and game, of Louisiana.

Since I have read about Louisiana Nature Guardians I have become interested in the Club, and would like to be a member. I think that every body should help to protect the birds, animals, and trees of Louisiana.

When answering this, please send me a little explanation of the Nature Guardians work.

My pal's name is Raymond Johnson, Box 66, Berwick, La. He wants to get the Conservation Review monthly, as I do.

Yours affectionately,
Henry Burrell.

Georgetown, La.
July 2, 1931.

DEAR EDITOR: I read the Louisiana Conservation Review every month, and I enjoy no part of it more than I do the interesting letters from the Nature Guardians. My father is a forest patrolman and I like to go through the woods with him while he is patrolling. When I listen to the birds singing in the spring and summer it makes me think how distressing it would be to live in a country where there are no birds.

I like to watch the birds raise young ones in our orchard nearby, as well as I like to eat the fruit.

Will you please enroll me as a member and send me my badge and literature? Hoping to hear from you in a short time.

I remain,
Mary Parker.

Doyline, La.
July 2, 1931.

DEAR EDITOR: I am interested in the Nature Guardian Club, and would like to become a member. Please send me an application card

Thanking you, I am, yours very truly,
Webb Perritt.

DEAR MRS. GUSTEN: We are happy to enroll Floma, and we are sure that she will be an enthusiastic Guardian, with such an earnest mother to stand sponsor for her.

Morganza, La.
July 15, 1931.

DEAR EDITOR: My little girl, Floma Gustin, age eight, would like to join the Bird Club. What must she do to earn a certificate and pin?

Yours truly,
Mrs. W. L. Gustin.

Selma, La., Box 291.

DEAR EDITOR: Enclosed you will find a poem which I am sending to your interesting Club. I like birds very much, and would like to have some pictures and some information about them.

Yours truly,
Dorothy Rambeau.

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DON'T KILL THE BIRDS

Don't kill the birds!
The little birds,
That sing about your door
Soon as joyous spring has come
And chilling storms are o'er.

The little birds!
How sweet they sing!
Oh, let them joyous live;
And do not seek to take the life
Which you can never give.

Don't kill the birds!
The pretty birds,
That play among the trees,
For earth would be a cheerless place
If it were not for these.

Dorothy, it was very sweet of you to send the poem. It is an old favorite of ours. We have no pictures to send you, but we are sending you one of our Bird Primers.

New Orleans, La.
3111 Palmyra Street
July 6, 1931.

DEAR EDITOR: Please send me an application card, as I am a lover of nature and I am sure I can live up to my oath.

Yours truly,
Emmett S. Russell.

Good for you Emmett! I am sure we need your help very much.

Here is a cheerful poem that we want you all to read. If only we all had the stamina to carry out the spirit of it every single day!

RESOLUTIONS FOR "GOOD MORNING"

I will start anew this morning with a higher, fairer creed;
I will cease to stand complaining of my ruthless neighbor's greed;
I will cease to sit repining while my duty's call is clear;
I will waste no moment whining, and my heart shall know no fear.

I will look sometimes about me for the things that merit phrase;
I will search for hidden beauties that elude the grumbler's gaze;
I will try to find contentment in the paths that I must tread;
I will cease to have resentment when another moves ahead.

I will not be swayed by envy when my rival's strength is shown;
I will not deny his merit, but I'll strive to prove my own;
I will try to see the beauty spread before me, rain or shine;
I will cease to preach your duty and be more concerned with mine.

—Selected.

Here are some newly registered members, whom we welcome cordially:

Evelyn Lowney
Box No. 165,
Mansfield, La.

Maline Ellard,
Trout, La.

Mary B. Redding,
740 Oneonta St.,
Shreveport, La.

Rose Harbeson,
2122 Southern Ave.,
Shreveport, La.

Francis Tilley,
Mansfield Graham,
Shreveport, La.

Rose May Slattery,
943 Blvd.,
Shreveport, La.

Mary Francis Slattery,
2302 Thornhill Ave.,
Shreveport, La.

Dorothea Erickson,
423 Herndon Ave.,
Alexandria, La.

Gwendolyn Turner,
2000 Olive St.,
Baton Rouge, La.

Al. Lyons,
659 Rutherford St.,
Shreveport, La.

P. J. Thiac, Jr.,
Bogalusa, La.

J. H. Lyda, Jr.,
402 Virginia Ave.,
Bogalusa, La.

Edwin Gleen,
602 K. Street,
Monroe, La.

Romona Spurlock,
521 Wilkinson St.,
Shreveport, La.

Betty Alexandria,
2036 Jackson St.,
Alexandria, La.

Dorothy Goonevell,
Good Pine, La.

Grace Slattery,
943 Boulevard,
Shreveport, La.

James H. Wells,
140 Wilkinson,
Shreveport, La.

We shall be glad to hear from our members at any time, and shall be glad to print their poems, themes, and letters about any of the natural resources of Louisiana. We hope that our next issue will contain many interesting articles by members of our Club.

Address all letters to:
NATURE GUARDIAN EDITOR,
DEPARTMENT OF CONSERVATION,
New Court Building, N. O.

ANNOUNCEMENT!

We regret that upon going to press we had not received all the photographs of the prize winners in the "Bird Conservation Contest." However, the pictures of the winning contestants will appear in a subsequent issue.

SLOW MOURNFUL DIRGE

What a hard boiled bird is the Montanan
To wage dire war on the Pelican,
To deem all fish
Should be saved for a dish
To feed and nourish a Northern man.
But list to a war cry from Louisiane,
Don't get too rough with our Pelican,
Conserve your fish
As much as you wish
But, kill our mascots. (*Like hell you can.*)

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NEW ORLEANS, LA.

MOODS OF BEAUTY

(*Continued from page 5*)

" 'The great artist does not reproduce nature—but expresses in his picture the choicest feeling of beauty or emotion which that bit of nature has produced upon him,' said the beloved Robert Henri.

"The great secret is in those two statements. But the difficulty is always to know just how to apply principles to the problem in hand. So let's begin at the beginning."

The Girl Tourist nodded.

"First you must learn to see beauty—before you can feel it. We are looking at a beautiful picture right now—the fading sunset glow deepening the purple shadows below, and all reflected in the dark mirror at our feet. It is nature in one of her loveliest moods. We always think of nature as feminine. Was there ever a woman so perfect as to be beautiful and appealing in all of her moods? Then why expect it of nature?

"Suppose now, that you were expecting to meet a man you wanted to win. Would you want that first meeting to be after you had stood for hours in the blazing sun, and were hot and dusty and squint-eyed—without a single shadow to soften the harshness or to bring out a curve?"

"Of course not," she said dreamily. "I would want it to be in a setting of soft lights and shadows. I would wear filmy, misty draperies. I——"

"Exactly," he interrupted "And that is a perfect description of the scene we are enjoying right now. Then why not give nature as good a break?"

"But is twilight the only time?"

"Certainly not! But don't you realize that you cannot bring out the shape of any object without lighting it, partially at least? With the only light coming from behind you the most perfectly modeled body would look as flat as a pancake. The same thing is true of a group of objects—a landscape. Of course there is always some reflected light and a few redeeming shadows. Nevertheless, you chose the worst possible lighting for your scene."

"I begin to understand, but how should I have photographed it?"

"Not so fast! Just now we are concerned only with how you should see things—not your camera. Your camera saw exactly what you saw—except for color. That was one thing that fooled you. Remember, your camera is color-blind, except as color is suggested by contrasting tones of light and shade. So you must learn to be color-blind, too. Buy a photographer's 'blue-glass.' It reduces all colors to the varying tones of one color, just as your camera does. Carry it with you and try it on everything. People may think you are goofy, but you won't care if you get a real picture.

"But you have only begun. Every object, every scene, has its varying moods of beauty—and the only moods you can truly express are those you can feel. Make an intimate study of her many moods, and your own reactions to them. What moments appeal to you, stir you most—make you long to catch them and hold them forever? These are the moods you can teach your camera to see as you see them, and so reveal them to others. It will cost you real effort and sacrifice. If you should choose this little park as your first school, you ought to be down here before dawn, day after day. Time after time you will be disappointed as the sun rises bright and clear, or remains completely hidden behind dull gray clouds. But sooner or later they will break just right, and a picture may unfold that is even more beautiful than the way you dreamed it.

"Perhaps a soft white mist will be rising, transforming the familiar scene into an intangible dream-world—a land of illusion—that is yours alone, to catch and hold. And so through the changing seasons you will see and know and love a thousand different pictures, and learn to interpret all these moods of beauty in the universal language of lights and shadows.

"I find that it is the mysterious, the dreamy, the fantastic, that is most alluring to me. I love the glowing sunsets, the misty awakening of dawn—but oh the magic of moonlight!—the mystery of the veiling shadows that spurs the imagination into endless dreams—and oh for a magic camera to catch and hold all the dreams we dream!"

"Yes," she said softly, "I understand."

"Then come with me. I will give you one little peep into my Fairyland."

They came to a pause among the deep shadows at the edge of the little lake. "Now look through the weeping-willow window," he whispered, pointing out through the dark curtain of pendant boughs, "and you will see the deep moat that guards that mystic world beyond."

For a long moment they stood silent, while the witchery of the western night stole over their senses. Then came a vibrant whisper that seemed only to deepen the spell.

"Look—over there by the tall reeds! See the little fleet of white water lilies, sailing through the moonlight—and the one in the lead, how it seems to glow with a phosphorescent light?"

(*Continued on page 39*)

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THE GREAT OUTDOORS OF THE SOUTHLAND

(*Continued from page 8*)

New Orleans in the next decade—What will it mean to those privileged to enjoy its grandeurs in this and coming generations. Picture, if possible, a vacation from the fuss and fury of city life in such an outdoors. What could be more alluring to those who suffer the hardships of northern winters and the unbearable heat of northern summers, than to sojourn here, or to live in the Great Outdoors of the Southland? Camping if you choose, a villa on the river, a cottage by the sea, or an estate on the highway with orchards, gardens, chickens and cows for self support, and all the comforts of the city dweller plus peace and quiet and all the joy of life in the Great Outdoors.

What say the hunter and fisherman who bought more than seven million licenses in the United States last year for sums varying from one to one hundred dollars each—what says the world whose growing desire is for the Outdoors; what says the tourist seeking the woodlands—the pines always green and ever alluring:

"Poems are made by fools like me
Only God can make a tree."

But we can and must preserve, conserve and protect. Even here, now, in this Great Outdoors, pine trees are struggling in the effort to live and perpetuate—but 'tis a losing fight against the axman, the hog and the arch-demon, fire. These trees must be protected. Not merely from a standpoint of intrinsic or commercial value for lumber or paper for future generations, but for the sake of the Great Outdoors which, without the woodlands, is but an empty thing; for health's sake, that the world famed ozone belt may be conserved for "the healing of the nations"; for scenic beauty's sake, for without the trees and wildflowers the countryside cannot be "altogether beautiful"; for the sake of wild life, fast becoming extinct as a result of causes, the chief of which is destruction of woodlands by fire; and for the fishes' sake too, because they must have food or become cannibals.

It is said that certain northern states having only six months in the year to attract with hunting and fishing lures, collect $200,000,000.00 annually from tourists—one of these states alone sold $7,000,000.00 worth of hunting licenses in a year. The demand for licenses has increased at the rate of 250,000 a year in the face of smaller bags, more closed seasons and shorter seasons, all because certain hunted species are fast becoming extinct, for lack of protection and propagation. We cannot rely on unprotected wild life to perpetuate the species—to fight its own battles against fires, vermin, and starvation.

A Scotchman named Ross detailed to lay out a huge game preserve in England, made a survey of the vast areas in the United States, "where thousands go annually with gun in hand and hope in heart," says, "It's a sad thing to see possibilities such as I viewed in America going to waste. But with little effort properly directed," he said, "within ten years—aye, less, you'd have the grandest country in the world for field sports."

The Great Outdoors of the Southland must be conserved. Its woodlands and moors protected from devastating fires, that trees, shrubbery and wild flowers may live and multiply. Its wild life must be protected and propagated that it may become the Grandest Outdoors in the world for field sports. And it must be made available in all its glory, to those seeking health and happiness so abundant in the Great Outdoors of the Southland. Truly it is a laudable effort and will be crowned with success.

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COMMERCIAL PRODUCTION OF MENHADEN FISH OIL FOR ANIMAL FEEDING

(Continued from page 19)

moved without difficulty by passing the liquor through a continuous rotary screen constructed of 60-mesh brass wire.* The screened liquors, however, will contain too great a quantity of fine suspended matter to be passed direct to the commonly known type of oil separator. These separators make an oil and water separation only. Some very fine solids are flushed out with the water, but the greater portion of the suspended material is retained in the bowl. After a certain amount of cake has formed in the bowl, the machine must be shut down and this material removed. Consequently, great difficulty and inconvenience would result. For this reason, it is suggested that a special type of centrifugal be used. In this machine an allowance has been made for the removal of solids by small nozzles placed in the wall of the bowl. This permits a discharge of small solids and a portion of the water through the nozzles in addition to the usual oil and water separation made by other types of separators. The oil discharged from the oil outlet may be expected to contain a small amount of moisture and possibly minute particles of flesh. This oil would then be passed to a centrifugal oil purifier which will yield a clean dry oil.

The second method would require the use of (a) an imperforate bowl centrifuge of the extractor type, (b) a suitable screening arrangement for recovering solids, and (c) a centrifugal oil and water separator. Experience by certain sardine oil and cod-liver oil manufacturers as well as experiments conducted by technologists (Harrison, 1931) of the Bureau of Fisheries has shown that centrifugal machines of the extractor type will make a satisfactory preliminary separation. The oil will be discharged at one outlet with a portion of the waste water while the suspended material and remaining waste water will be retained in the machine to be discharged periodically or continuously, depending upon whether the machine is intermittent or continuous in operation. The oil mixture discharged from this machine would then be passed to a centrifugal oil separator for the final oil separation. The water and solids discharged would be drained or screened and the recovered material pressed again to recover additional oil.

The third method would require (a) immediate filtration of chemically treated press liquor, (b) mechanical separation of the filtered liquor, and (c) mechanical purification of the separated oil.

Taylor* found that menhaden press liquors treated with a chemical coagulant could be filtered satisfactorily in a press of the recessed plate or plate and frame type. From the standpoint of economy in chemical treatment, best results were obtained when commercial-grade aluminum sulphate was used in the proportion of 1 pound of aluminum sulphate to each 12 gallons of press liquor. This would be approximately 5 pounds of coagulant for the liquors from each 1,000 menhaden (quarter box measure) reduced. By using the above process he found that the filter removed all of the suspended material in the liquor. In addition, a part of the dissolved material, which was coagulated by the added chemical, was removed also and the emulsion was broken partially. Liquors so treated could be passed direct to large oil separators, where the oil would be removed. If an attempt was made to obtain a dry oil with this machine, it is possible that some oil would be lost. In this case it may prove more economical to allow a small amount of water to discharge with the oil and make the final separation in a smaller oil purifier.

The fourth method would require (a) the use of a screen to remove the bulk of the suspended material as the liquor flowed from press floor, (b) the use of the present system of gravity separation tanks, and (c) a centrifugal separator to remove the oil from the separated emulsion. Inasmuch as a small quantity of suspended particles will be contained in the unbroken emulsion, the centrifugal machine will no doubt have to be cleaned at intervals during the day's run.

The fifth method would permit the use of the present factory process up to the point where the oil and emulsion is floated to the cooking tanks. Instead of passing this rich oily liquor to the cooking tanks, however, it would be mixed with some such filter aid as maple sawdust and be forced through a recessed plate or plate and frame filter press. This operation would remove all suspended material and partially break the emulsion. The filtered liquor then would be passed to a centrifugal oil separator or purifier, where the remaining water would be separated from the oil.

Although the last two methods of procedure appear the easiest to adapt to the present factory process, it is believed that the final oil would not be as good. This is due to the fact that during the time the oil is in the separatory tanks it is susceptible to oxidation and bacterial action; and, as shown by the data obtained, a considerable increase in acidity results.

ADDITIONAL CONSIDERATION RELATING TO FACTORY OPERATION

In addition to the changes recommended as desirable in the present reduction process, there are several factors which must be considered by menhaden operators desiring to produce an oil for animal feeding.

Condition of Raw Material

Oil to be used in animal feeding should be manufactured from fresh fish. Fish which are considered suitable for manufacture into oil for technical use, however, will not be fresh enough in every case for this special market. The standards for judging freshness should be rigorous, consequently greater consideration must be given to the condition of the raw material landed at the factory.

When vessels are not equipped with chilled storage it is impossible for them to land all cargoes in a fresh condition. Occasionally a vessel will fish at great distance from the factory and several days will elapse before a load is obtained. As a result of the prevailing atmospheric temperatures during the season in which the menhaden fishery is prosecuted, fish held this length of time can not be considered fresh. Therefore, unless the vessels are equipped to land fresh fish at all times, the factory operator must segregate the loads of suitable and unsuitable raw material and process them separately.

Cleanliness at the Factory

Cleanliness of factory premises and factory equipment should be a prerequisite of factories producing oil for animal feeding. This should not only be for the purpose of establishing the confidence of the user of the product, but also as a protection against contaminating the fresh material being used.

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*There are several types of mechanical screens and filters now on the market which should be considered also.

*A study of Press Liquors from Fish Oil and Fertilizer Plants, by Dr. Robert S. Taylor. Unpublished report in the files of the Bureau of Fisheries.

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Conveyors, which are not cleaned frequently, cause an unsightly appearance in the factory. Mutilated fish become attached to the sides and moving parts. If this material is not removed it soon becomes putrefied, and contaminates any fresh material handled subsequently in such conveyors. The above will apply also to the storage compartments, the oil separating tanks, and the conveyors from the cookers to the press room. Where these are not cleaned frequently a condition results that can reflect only to the discredit of the product manufactured.

Purification of the Manufactured Products

Oil manufactured by the several processes suggested should be practically free from moisture and minute suspended impurities. When stored under proper conditions it should suffer little change in composition over a considerable period of time. In standing and becoming chilled, however, a solid fraction called "stearine" will settle out. The stearine represents a portion of the mixture of glycerides or fatty acids, composing the oil, which have higher melting points. According to biochemists, there is little or no difference between the two fractions from the standpoint of vitamin value. The presence of the material, however causes the oil to become cloudy and gives an uninformed user the impression that some foreign impurity has settled out. Consequently, it has become common practice in the cod-liver oil industry to chill the oil and remove the "stearine" by forcing the chilled material through a pressure filter press. This also gives additional gravity against the presence of suspended foreign matter. In general this final treatment is assumed by the concern packaging the oil for sale to the feed distributor or ultimate consumer.

Proper Storage of the Manufactured Product

Menhaden oil manufactured for use in animal nutrition should not be stored in open tanks of the type in common use in this industry. Exposure of the oil to sunlight, moisture, and the oxygen in the air increases acidity, rancidity, and is considered destructive to certain of the nutritional factors contained in the oil. For this reason it is suggested that the oil be stored in clean, closed containers.

MARKETING CONSIDERATIONS

Inasmuch as the use of fish oils, with the exception of cod-liver oil, in animal nutrition is relatively new, there are certain problems which the menhaden operator should understand before choosing his method of marketing procedure.

Menhaden oil is not established with the trade as a substitute for cod-liver oil, hence a market must be created for it. The operator must determine (a) whether it would be more desirable for him as an individual or as a member of an association to assume the responsibility of the advertising and sales propaganda required to establish the oil with the feed dealer and ultimate consumer or (b) whether it would be more desirable to sell to concerns who have established markets for feeding oils and let them push the oil under their trade name.

Inasmuch as the market for the oil has not been established, the future possibilities of the oil in this field are undetermined. Consequently the operator must make a study of the possible magnitude of the market, with due consideration to competitive products, in order to judge production requirements. This necessity holds regardless of the marketing procedure followed.

Oil to be used in animal nutrition can not be marketed by the simple standards which now prevail in the selling of crude menhaden oil for technical use. All products of this nature must be sold in accordance with the laws which regulate the sale of foods and drugs. Consequently all claims concerning the usefulness of the oil must be based on the proper type of biochemical data.

The animal feeder who uses menhaden oil will purchase the oil for its vitamin value and will expect a guarantee to that effect. Inasmuch as the vitamin value of the oil may be expected to vary at times, owing to the effect of feeding conditions in different fishing areas during the fishing season, considerable biochemical control work will be required. Unfortunately data of this kind can not be obtained at this time by simple chemical tests. Such information can be determined only as a result of carefully controlled feeding tests, on experimental laboratory animals, under the guidance of a trained biochemist.

CONCLUSION

Experiments conducted by technologists of the bureau have demonstrated the steps in the present process for the manufacture of menhaden oil, which are most destructive to the nutritional value of the oil. Accordingly an effort has been made to describe how alterations may be made in actual factory procedure in order to duplicate the experimental results. The authors have refrained from recommending any one definite method to follow but have preferred to suggest several for consideration since the operating problems at each factory may be expected to differ. It is believed that at least one of the methods or some modification should be found suitable for application in any factory manufacturing menhaden oil. In addition to the commercial aspect of the problem it is believed that the biochemical data obtained indicate that vitamin D is more unstable than previously believed.

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MOODS OF BEAUTY

(*Continued from page 33*)

The Girl Tourist nodded breathlessly. "I see a misty, luminous little cloud, rising from the heart of it." Her voice was like the voice of one in a trance. "And through it I can see something moving, something alive, a tiny white form. I know! It is a silvery Undine, lighting the Lily-Glow!"

A happy laugh broke the spell and brought her back to earth. "Atta girl!" chuckled the Vagabond Photographer. "I had a hunch you could be as goofy as I am—and some day I'll teach you how to make your camera see it too!"

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ECONOMIC VALUE OF UTILIZING LAND AREAS FOR FORESTS

(*Continued from page 22*)

less. The timber of the persimmon tree is a most satisfactory fuel. A cord of air-dry wood yields the same amount of heat as a ton of bituminous coal of good grade. Industrially, the wood is indispensable in the manufacture of shuttles used in textile mills; besides the home consumption, more than half of the shuttle blocks manufactured in America are used in foreign countries. Persimmon wood is used extensively in the manufacture of golf clubs; and more than 100,000 rough persimmon blocks are used annually in making shoe lasts.

The dogwood, like the persimmon, is a hardwood tree of superior properties in hardness, toughness, fineness of texture and smoothness when subjected to wear. Its timber uses are the same as those of the persimmon. The tree is easily and quickly grown on almost any type of land in Georgia. In the fall the tree bears beautiful red berries, good food for birds, as well as cattle. When these berries mature they drop to the ground. The dogwood has an artistic, as well as utilitarian value. The beauty of 10,000 dogwoods blossoming on a 100-acre tract would be almost indescribable.

When dry, the wood is also one of the best of fuels. Both the thorny and thornless varieties of honey-locusts grow in Georgia. The thorny variety bears enormous crops, with the locust 6 to 12 inches long, and having on the thick side what is considered delicious meat, with many seed. Cattle find this locust very palatable. On suitable soil a 25-year-old tree should produce from 29 to 40 bushels of fruit. One hundred acres of trees would yield 500,000 pounds of cattle food. Not only is the fruit excellent stock food, but it may be made also into a refreshing drink with a delicious flavor. Like the sourwood, the honey-locust produces honey, though less valuable than the former.

As already stated, posts from the black-locust endure for from 50 to 100 years. Hence the black-locust is more valuable for telephone lines and for all uses where the wood is constantly exposed to the weather, or is placed in the earth.

As far south as Columbus, Georgia, black walnut is cut and shipped for commercial use. This tree is one of the most valuable in America, and planting of the trees on the un-used or idle farm lands would prove an excellent investment. Some idea of its worth in the furniture industry may be gained from the statement of one manufacturer—that one cord of high-grade walnut timber, made into the highest grade of furniture, might be valued as high as $500,000. No other American timber is so highly prized for this use.

The black walnut tree is a prolific bearer of a useful fruit. There is a growing demand for the kernels of the nuts, which are used chiefly in candy-making, and which are gaining popularity in breads, cakes and salads. Prices to the grower have been from $1 to $2 a bushel, but more recently have ranged up to $4. The Georgia black walnut is of excellent quality. The hull of the walnut contains a dye, the properties of which have not been definitely determined, though the dye was used extensively for dyeing jeans and woolen materials in the South during the war between the States. Research may disclose in the walnut hull a great value for dye manufacturers.

The mulberry, the white oak, and the post oak are other hardwoods quite common down in our State of Georgia, which might be considered of commercial value.

The Federal Government, by research and experimental work on 700 acres of land, dedicated as a laboratory under the direction of the Government, might give aid possibly far more valuable than that of lending money to the farmer. It is far better to educate the farmer to utilize his own resources and stimulate him to intellectual expansion concerning his own affairs, than it is to lead him to be dependent upon the Government to furnish him money that he can never return. The farmer, like every other citizen, must finally depend upon the development of his own brain power and energy to sustain him and make him a stronger man, a better citizen and a more active element in the State.

I offered to the United States Government 700 acres of land, to be accepted in any part of Georgia, on which to place 70,000 hardwood trees, planting 100 acres in persimmon; 100 acres in dogwood; 100 acres in walnut; 100 acres in black locust; 100 acres in honey locust; 100 acres in sourwood, and 100 acres in mulberry—giving 70,000 trees for research and demonstration for the farmers of the South and the Nation.

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A committee of experts named by the United States commissioner of education conducted the tests after the Fox Film Corporation prepared the pictures. The boys and girls were given preliminary tests to sound out their knowledge on the selected subjects, and after seeing the pictures, they were given another test. The pictures were only shown once. The subjects were selected, for the most part, because the students presumably had studied the subjects in grammar school.

"Boys and girls, who have presumably studied glaciers, volcanoes and river valleys," said the special committee report, "gained 42.5 percent, 79.8 percent, and 156.3 percent over their first scores on these subjects, respectively. In the field of science, which is less extensively taught in elementary schools than geography, exceptionally high gains were made. These facts indicate a strong supplementary value in sound motion pictures."

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